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ABSTRACT

This bulletin is published annually in the interest of children with learning disabilities, language disabilities, or dyslexia. Specific topics covered in the nine articles include: the advantages of being dyslexic; the neuropsychological aspects of reading and writing; the study of dyslexia, including two trends and a neuropsychological model; language development in children; small group instruction for language skills improvement; written expression; language and learning therapy in a community college; helping parents to help their children; and the dyslexic in the classroom. (FL)

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BULLETIN OF THE ORTON SOCIETY

AN INTERDISCIPLINARY JOURNAL OF SPECIFIC LANGUAGE DISABILITY

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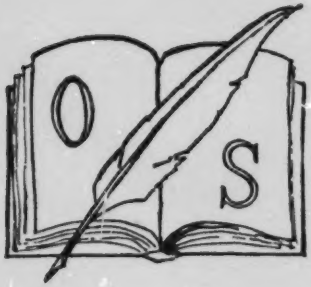

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BULLETIN OF THE ORTON SOCIETY

Volume XXVI, 1976

Editor: Margaret B. Rawson *Associate Editor:* Jan paul Miller

FOREWORD

This twenty-sixth issue of *The Bulletin of the Orton Society* contains papers selected from those presented at the Society's Twenty-Sixth Annual Conference, Santa Barbara, California, November, 1975, and from those submitted by other authors.

As always, the views presented throughout the volume are those of the writers, for The Orton Society holds neither an official view nor judgmental responsibility. Responsibility for the inclusion of all materials rests with the Editors, to whom they seem relevant to the Society's stated purpose: "the study, treatment, and prevention of problems of specific language disability."

An index to the titles and authors of the contents of the first twenty-five volumes of the Bulletin is available, as well as a brochure stating the Society's purpose, conditions for membership, and a listing of its current publications. Interested persons should write the Society's central office for such information.

Comments and criticisms from readers of the Bulletin are welcome. Papers and other contributions to be considered for publication in Volume XXVII should be submitted as long as possible before January 1, 1977, in duplicate and in conformance with the Instructions to Contributors, a copy of which is available from the Society's national office.

Margaret Byrd Rawson
Editor

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Orton Society Awards

RICHARD L. MASLAND, M.D.
THE SAMUEL T. ORTON
AWARD FOR 1975
The Orton Society—International
Twenty-sixth Annual Conference
Santa Barbara, California
November 21, 1975

MARY WOOTON MASLAND, M.A.
THE NEW YORK STATE BRANCH
AWARD FOR 1976
The Orton Society—
New York State Branch
Third Annual Conference
Rochester, New York
March 19, 1976

Since 1975–1976 was the season in which the Orton Society did what it should in recognition of the great contributions of Richard and Mary Masland to the work of its field, it seems appropriate that their introductions to their respective Award Banquet audiences be published together here. It was fitting that Dick should be honored directly and Molly collaterally at the International meeting of the Society in the West, while Molly should be the prime, and Dick the associated, recipient at the grassroots level, in the East, in the state of the Society's birth. Knowing these two people as well as we do, we know that they value both kinds of honor equally and have none of the currently fashionable prejudices about who is the sun and who is the satellite on which occasion. It was my happy privilege to give both of the introductions which follow.

—Margaret Byrd Rawson

The Samuel T. Orton Award for 1975

Presented by the Orton Society to

Richard L. Masland, M.D.

Introduction by Margaret B. Rawson

No assignment could give me a greater sense of high honor and privilege than the one that is mine tonight—to make the presentation for the Orton Society of the Samuel T. Orton Award for 1975 to Richard L. Masland. First, I should like to tell you a bit about his background, summarizing some of the forces and events which have shaped his life.

I might have known Dick all his life, as I wish I had, for we grew up in the same world. He was born in Philadelphia when I was a child there, and

went to the Germantown Friends School while I was living across the street. As a boy he sailed the inland waters of the New Jersey seacoast and later the icy seas of the Grenfell Mission. He was graduated from Haverford College and received his M.D. degree from the University of Pennsylvania, which you will remember, was Dr. Orton's alma mater. The two men also had in common appointments at the Pennsylvania Hospital, a venerable and important psychiatric facility in Philadelphia, where other leaders in our field, Dr. Paul Dozier and Dr. Howard Rome, also worked at one time or another.

It was while Dick was engaged in research at the Johnson Foundation that my husband and I came to know him and his charming, able Canadian speech therapist bride, Molly Wooton Masland. Also, very briefly, we knew their cat. One day Felix, not understanding that his bellicose personality had just caused his life mission to change from that of household pet to laboratory subject, made history instead of data. He escaped from the scientist's hands to the laboratory window sill and leaped to freedom six stories below! At supper that night I heard from an incredulous eye-witness that Felix had landed unscathed on the sidewalk and made an alley-cat line for home several blocks away. That cat was right! Returning to the loving warmth of the Masland fireside has always been worth any effort, however heroic.

After the Johnson Foundation years and Dick's Army service at the School of Aviation Medicine, Randolph Field, Texas, the Maslands moved to Winston-Salem, North Carolina, and the Bowman-Gray School of Medicine. This brought them together with such Orton stalwarts as Lloyd Thompson and June Orton, Roger Saunders and Lucia Karnes. Here they launched their children, while Dick laid the keel for his 33-foot Chesapeake Bay sloop, *Meadowlark*. Of course he was also launching his neurological ship of state, teaching at Bowman-Gray, and practicing neurology and psychiatry. He became an authority on mental retardation, spent a year's leave as Research Director of the National Association for Retarded Children, and as senior author with Seymour Sarason and Thomas Gladwin began the distinguished volume, *Mental Subnormality*. This is only one of a long list of scientific publications.

The present era of my professional association and deep personal friendship with Dick and Molly began 16 years ago at the Orton Society's 10th Anniversary Dinner where they both spoke. By this time they had moved to Washington, where Dr. Masland had become Director of the National Institute of Neurological Diseases and Blindness (now the National Institute of

Neurological Diseases, Stroke, and Communicative Disorders). During this time his work on mental retardation brought him an award from the National Association for Retarded Children, with very special recognition from President John F. Kennedy. He also thought up and set going the tremendous, important and productive Collaborative Perinatal Project to study intensively and extensively some 53,000 women and their children in 14 areas of the U.S., to learn about the roots of children's developmental history. He carried out and fostered innumerable other research projects during his eleven years at the Institute, managing the Empire with such ease (or so it deceivingly seemed), grace, consummate leadership and effectiveness that it seemed almost to run by itself. Lao-tzu, the Chinese philosopher, might have had Richard Masland in mind when he said,

> . . . Of a good leader, who talks little,
> when his work is done, his aim fulfilled,
> they will all say, 'We did this ourselves.'

During these years Dick found time for leadership in our special field through participation in the work of the Interdisciplinary Committee on Reading Problems, and the Health, Education and Welfare Committee on Dyslexia and Related Reading Disorders, the publication of whose final report and working papers he assured. His counsel was invaluable to the Orton Society and to me as the needful president of those years. How often I marveled at his ability to cut through the knottiest of problems to a clear and cogent solution! His paper, "Brain Mechanisms Underlying the Language Function," presented at our annual meeting at Rockefeller University in 1968, marked a high point in our distinguished lecture series and is still very much in circulation.

Another Washington-era event of importance to the Maslands and their friends was the launching of the good ship *Meadowlark*, brought to craftsman-like completion in a Washington backyard. The boat, the Skipper and the Mate sailed superbly on the Chesapeake Bay as they still do in New York waters.

Richard Masland's next appointment was as head of the Department of Neurology, College of Physicians and Surgeons, Columbia University, and Director of the Neurological Institute. As Professor of Neurology, he has held chairs named in honor of Henry and Lucy Moses and H. Huston Merritt. Again he has followed the path of Dr. Orton, who would, I am sure, have

been pleased to see a younger authority in the language field at the helm of the institutions with which he himself had been identified.

Doctors, like judges and others in the learned professions, commonly and properly do not so much retire as give over some of their pressing administrative responsibilities so that they may have more time to devote to activities which seem especially important to their mature wisdom. True to this tradition, Richard Masland, while remaining Professor of Neurology, is now devoting his time to seeing patients, to pursuing the elusive secrets of epilepsy and to fostering other wide-ranging research.

Of particular interest to us is his continued work in brain science and the bases and manifestations of the human language function. Long a member of the Advisory Council of the Orton Society, he now has time to become a member of its Board of Directors, which, I suspect, is more a change of designation than of function, so generous has he always been with his time and his wisdom on which so many of us often have leaned. Behind the more public and professional career one finds in Dick and Molly Masland the perfect partnership of equals living in loving complementarity, enjoying their four talented grown children. Molly, also a leader in our field and veteran of the Orton Society's Board of Directors, is as much a recipient of tonight's award as is her distinguished husband.

The best kind of gift is one the giver really wants to give and hopes the recipient will be equally happy to accept. It is like that with this award. Dick Masland does not need another citation, for he has been so honored many many times for his work in the understanding of human living and the alleviation of its many stresses. He does not have to need the award for the Orton Society to want supremely to bestow it, and we hope he will be as happy to join the Samuel T. Orton Award fellowship as we are to welcome him, with the following citation:

RICHARD L. MASLAND, M.D.

Productive scientist; talented administrator; gifted and beloved teacher; clear and cogent writer and speaker; skilled, compassionate physician, who has worked tirelessly and effectively to ease the lot of disabled and troubled children and adults; counselor to individual workers and organizations and especially valued guide to the Orton Society; innovative seeker after understanding of the human language function, its variations

and disorders, and interpreter of this knowledge to a widely diverse public; wise, warm and delightful friend; Richard L. Masland, The Orton Society takes utmost pleasure as it does itself the honor of presenting to you

THE SAMUEL T. ORTON AWARD
FOR 1975

26th Annual Conference of The Orton Society, Inc.
Santa Barbara, California, November 21, 1975.

The New York State Branch of The Orton Society
1976 Award to
Mary Wooton Masland, M.A.

Introduction by Margaret B. Rawson

It gives me the warmest possible pleasure to talk to you tonight about the recipient of the 1976 Award of the New York State Branch of the Orton Society.

The basic vitality of the Orton Society comes from several sources. One of the most important of these is the strength it gives to its members as they work in their separate fields in the interests of individual learners of language. Another is the sense of relatedness of its members to one another. Molly Masland contributes to both. First, she helps people through her research and innovative programs and through her warm, insightful, truly beautiful work with her small patients and with their troubled elders. What she does and the way she does it should be available as a "best model" to all young language therapists. And for the second attribute it is hard to think of a better exemplar than Molly. She is both well-loved as a person and highly respected and admired as a colleague. Moreover, as one of her associates, who already stood six feet tall, said of her, "She may not be very big herself, but you always leave her feeling inches taller than you did when you came in." She does this for each of us, and for the Orton Society, too. Perhaps some glimpses into her life history will give us a clearer idea of how she came to be the person it is our good fortune to know today.

Mary Wooton was born in Canada and did her undergraduate work as a pre-medical student at Montreal's famous McGill University. She went away to Oberlin for her M.A. in psychology and then back to Montreal to start a speech clinic at the Children's Memorial Hospital. In 1940 she married Richard L. Masland, a young neurologist in Philadelphia, and so joined the professional circle of which the Rawsons were also a part. Molly did not have to fight the women's liberation battle. With her mother's professional career as an example and the active support through the years of a husband who believed it as important for women as for men to continue to grow as whole persons, it was to be expected that she should continue her work in speech and language diagnosis and therapy from Philadelphia on.

Later, after the war years in Texas, when the Maslands moved to Winston-Salem, North Carolina, Molly kept her professional hand in while her children were small by working part-time in association with June L. Orton.

This connection with the more extended field of specific language disability strengthened her understanding that every child's language development is a continuum, with each stage related integrally with his past development and with his future. Pursuing this conviction, Molly has been a strong force in bringing together many people in the speech and hearing field with those interested in school-age and later academic problems. Each of us has been enriched and enabled to be more effective because of her emphasis on our necessary interdependence.

While the Maslands were in Winston-Salem, Molly reports, "Dick started to build our sailboat, *Meadowlark*. It was my job to grow the crew." Now the 33-foot vessel can just about hold the parents and Dick, Jr., the neurophysiologist; Frances, the artist; Eleanor, the graduate student (studying learning disabilities); and Tom, the journalist.

When Dick became head of the National Institute of Neurological Diseases and Blindness, and its organizational successors, Molly answered many calls to professional activity in the Washington area which added up to more than what the rest of us would have found a full-time job, while still graciously welcoming visitors from the four corners of the earth—and around the local corner, too. She was Chairman of the Speech and Language Department of the Montgomery County Easter Seal Treatment Center, where she established a new and still effective program for language-delayed pre-schoolers. As consultant to the County Health Department, she worked on early identification, and especially on original research on the problems of "rubella babies." She lectured regularly at The Johns Hopkins University in Baltimore, worked on the Collaborative Perinatal Study there, and carried out innumerable other projects, large and small. I particularly enjoyed our association in a 20-week course she and I gave together for language therapists. The Washington period was a rich chapter which could be expanded far beyond the time this occasion permits.

Since 1968, in the New York area, Molly has developed at Columbia University's Teachers College a program for 3-year-olds delayed in language development. She has worked through the public schools of Englewood, New Jersey (where she lives), with teachers, para-professionals and parents of 4-year-olds. She has set up a School Volunteer Program to identify and help academically "at-risk" kindergartners—a "pilot feasibility project" which has been so successful that it is now ready for expansion. She has also worked with Katrina de Hirsch in her private practice, taught therapist-teachers at

Manhattanville College, and done a host of other things to make herself valuable and beloved, as witness tonight's Award.

Asked to indicate some of her interests, she has replied, "Better day care for children, sailing, art, music," and in her own large, bold capitals, "FRIENDS," who, we all add, bless that interest and all that comes from it!

I have covered, or hovered over, a lot of territory since I last saw Molly when we sat at a table like this in Santa Barbara in November. On my way to my rendezvous here with her and the vernal equinox, I've met with many of her Orton Society friends, all across the continent, from Maryland and D.C. to San Francisco, Seattle, Vancouver (in her native Canada), to the newest and most distant Far North Branch of the Society in Alaska. Lots of people know about tonight's event and are enthusiastic "grass-rooters" for the largest Branch of the Society, New York State, as it recognizes an Orton Society Citizen *par excellence*, Mary Wooton Masland. (Citation read by George Meyer, President of the New York State Branch of The Orton Society.)

The Advantages of Being Dyslexic

Richard L. Masland, M.D.

I am deeply honored to receive the award from The Orton Society, especially since it is in the name of Dr. Samuel Orton. He was a great man, and his work is still too little appreciated. In reviewing his writings I am constantly impressed with the meticulous care with which he studied each child, and by his creative imagination which permitted new insights into the causative mechanisms of language disabilities. Last year at the annual banquet of this Society I talked briefly about his theories in the light of current knowledge of how the brain works. At the risk of being repetitious I should like to recapitulate the general theme of his theory of cerebral dominance.

You will recall that Dr. Orton studied a group of patients in whom letter and word reversals were an extremely prominent phenomenon. He coined a new term for these patients, and stated his theory about them as follows:

> I have offered the term strephosymbolia to define the cases of retardation of reading skills in which there can be demonstrated a confusion between dextrad and sinistrad orientation of letters; a tendency toward sinistrad reading of all or parts of words; and an unusual skill in mirror writing.[1]

Somewhat similar cases had previously been described by Hinshelwood and others under the name of "word blindness." Dr. Hinshelwood had considered that this condition could be diagnosed only when there existed a very serious disorder of reading. Dr. Orton took exception to this approach, pointing out that there was a continuum of difficulty from the most severe to the least severe, and that, in fact, there was a tendency toward strephosymbolia in almost all children at some phase in the development of writing skills. Although Dr. Orton was careful to point out that there were many different forms of reading disability, it is clear that he considered "strephosymbolia" to be a major component in the overall problem.

His explanation for this tendency toward distorted or backward writing was an ingenious one. He noted that all language functions are ordinarily

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This paper was given by Dr. Masland at the Award Banquet in Santa Barbara, California, November 1975, when he was the recipient of The Samuel T. Orton Award for 1975 (see p. 2 above).

controlled by the left hemisphere of the brain. He postulated that visual impressions were received by both sides of the brain—but as mirror images; and he concluded that confusion occurred when there was inadequately established dominance as a result of which the brain was uncertain as to which of these two mirror images was the correct one. He postulated that until such time as the dominant role of one hemisphere was firmly established there would be uncertainty as to which of the two mirror images would be followed.

The facts as we now know them turn out to be almost but not exactly as Dr. Orton had supposed. Thus, his thesis that visual patterns are stored in the two hemispheres as mirror images has been supported by animal experiments. The studies of Mello[2] and Noble[3] have demonstrated that if you train an animal to respond to a certain visual pattern projected exclusively to one hemisphere, he will prefer the mirror image when required to respond with the other hemisphere. Specifically, the eye of the pigeon projects only to the opposite hemisphere. If one eye is blindfolded, the visual image received by one eye will impinge only on the opposite side of the brain. If a pigeon is trained to respond to an asymmetrical pattern with one eye blindfolded, and then at a subsequent date has the opposite eye blindfolded, he will then select the mirror image pattern. Apparently the information relayed to the untrained hemisphere from that which had originally received the image is received as a mirror image. These studies support the thesis that the potential exists for right/left confusion within the organizational pattern of the two hemispheres.

Regarding the question of cerebral dominance, new evidence indicates that the right hemisphere is not just a weak counterpart of the left. Rather, it is the preferred site for the recognition and the analysis of visually and tactually presented patterns. Dr. Orton emphasized that a major hurdle in learning to read was the necessity to establish a firm and consistent association between a visually presented symbol and its auditory counterpart. He was not aware that, at least in the initial phases of reading, this association had to be made between two widely separate parts of the brain. Using tachistoscopic techniques it is possible to project a visual image to the right or left side of the brain. Under these circumstances it is demonstrable that the recognition of faces, patterns and unfamiliar objects is more effectively accomplished in the right hemisphere. The recognition of verbal material is ultimately more effectively accomplished on the left.[4]

Even more intriguing are the observations of patients whose hemispheres

have been separated by commissurotomy. Under these circumstances it is possible to test and evaluate the function of the two hemispheres independently. Studies suggest that, in fact, the two sides of the brain are not just a dominant and a submissive part, but rather that they even have differing and complementary modes of thought.[5]

Some time ago Luria[6] pointed out that there appeared to be two different types of mental analytical processes—one for the analysis of concomitant or simultaneous events; and the other for the analysis of successive events occurring in a sequence over time. There is evidence to suggest that the right side of the brain is, in its fundamental organizational structure, superior for the analysis of simultaneously occurring events such as is required for spatial orientation and the visual and tactual analyses and manipulation of shapes and objects. The left hemisphere is superior for the study of sequential events, of which the spoken language is the most important and sophisticated. Auditory dichotic listening tests demonstrate that meaningful sounds of up to less than 200 milliseconds in duration are most effectively recognized and interpreted in the right hemisphere. However, when longer sequences of sounds are involved and one is dealing with the understanding and comprehension of temporal patterns the left side is superior.[7] The left hemisphere is also the dominant hemisphere for the control of fine motor movements, especially that involving both sides of the body. Armed with speech, the left hemisphere also is the primary channel for human communication.

On the other hand, the right hemisphere through its superior correlative skills is more synthetic and manipulative in its mode of thought. It is looked upon by some as the more imaginative and creative feature of the brain.

Assuming that the two hemispheres are, in fact, organized this way, decoding of visual-verbal symbols may present a peculiarly difficult task. The unfamiliar geometric pattern of the written symbol is most effectively interpreted within the right hemisphere. It is necessary for the reader to convert this pattern of symbols into a temporal sequence and to associate it with a previously learned verbal concept. However, the recognition and interpretation of temporal sequences, and the entire language function, are situated in the left side of the brain. Thus, the decoding process requires, in its initial stages, an interaction between the two sides of the brain—two sides which may have different modes of thought. In some phase of the learning-to-read process, the task of the interpretation of visually presented symbols is actually transferred to the left hemisphere, even though the recognition of unfamiliar patterns and objects continues to be most effectively mediated on

the right. Because of the necessity for this changeover, it is easy to see how at a certain phase of reading in some individuals a confusion of mirror image patterns could occur.

Viewed in this light the training procedures recommended by Orton and Marion Monroe show remarkable insight. They reflect and emphasize the two fundamental problems inherent in these organization patterns—that of establishing associations between the visual symbol and its verbal counterpart; and that of establishing the appropriate sequencing of the auditory and written symbols—that is to say the conversion of the spatially presented array into a temporal sequence. In regard to the first of these it was emphasized that one should establish associations involving the simplest possible unit and use various reinforcement techniques in order to establish a firm association link. Regarding the latter, Dr. Orton says: "A major factor is a difficulty in repicturing or rebuilding in the order of presentation, sequences of letters."[8] In the training program it is necessary to " . . . look for such units as the child can use without difficulty . . . and direct our training toward the fusing of these smaller available units into larger and more complex wholes."[9]

Throughout these discussions Dr. Orton was careful to emphasize, however, that he was not recommending a panacea. He states:

> The highly individual character of the organization of skills and disabilities in a given child emphasizes the need of full analysis of each case, and an approach to treatment without fixed methods.[10]
>
> We have tried to avoid over-standardization lest the procedure become too inflexible and be looked upon as a routine method applicable to all cases of non-readers.[11]

In this connection it might also be emphasized that in coining a new term "strephosymbolia" and defining it in relation to the tendency toward reversal, Dr. Orton indicated that he was not dealing with the entire universe of non-readers.

Given these organizational patterns in the normal individual what characteristics may predispose to unusual difficulties in the learning to decode process? Possibly the fact that so many more boys than girls suffer from dyslexia may give us a clue. What are the recognized differences in the intellectual characteristics of boys and girls? Girls are more fluent in the use of language, and more skilful in fine motor movements such as are controlled bilaterally from the left side of the brain. This suggests a stronger left hemisphere. However, there also appears to be in girls a greater degree of

bilateral representation of language, and a lesser degree of specialization of spatial functions in the right hemisphere. Boys, on the other hand, appear to have a more highly specialized spatial type of skills. These findings suggest that the characteristics which predispose to reading disability would be first a weak left hemisphere within which there might be poor language structure and limited sequencing skills. Or equally important might be an unusually strong right hemisphere with highly developed spatial skills resistant to the transfer of these analytical processes to the left hemisphere.

There are studies of dyslexic children which provide some support for this thesis. T. T. S. Ingram[12] studied a group of poor readers, and divided them into two groups—those with very specific disabilities limited to reading as opposed to those with more general problems. The latter were inclined to have evidence of organic injury; the former to have a familial type of disorder. Among the familial dyslexics, a very large proportion showed superiority of performance as opposed to verbal skills on the WISC test. Symmes[13] made a study of 53 boys and one girl in whom she had been unable to find evidence of organic pathology. The outstanding characteristic of these 54 "constitutionally" dyslexic children was a very strong spatial type of skill.

This leads me to the topic of my talk which is "The Advantages of Being Dyslexic." Possibly I could change this to be "The Advantages of Being the Kind of Person Who Has Trouble Learning to Read." There is none of us who could believe that in our society there is any advantage in being unable to read. There are indications, however, that individuals who have had this difficulty may have unusual abilities in other spheres. Dr. Lloyd Thompson in his book[14] has reviewed the history of a number of such individuals. Margaret Rawson, in her follow-up study of dyslexic boys,[15] has documented the effectiveness of these individuals who were able to compete quite well with their peers in spite of the obvious handicap of difficulty in reading; they must have had some other compensatory assets.

Jerre Levy[16] has suggested the possibility that you can not have it both ways, that the development of superior language skills, investing functions on both sides of the brain, is at the expense of the spatial skills of the non-dominant hemisphere; and that, conversely, strongly developed spatial skills are at the expense of the language function. Experimental support for this thesis is equivocal. However, if true, it suggests that the number of effective dyslexic persons is more than a chance circumstance. It may help to explain the remarkable success stories which have been reported by Dr. Lloyd Thompson, Margaret Rawson, and others.

Viewed in this light, a question then arises regarding the proprieties of too vigorous efforts to enhance the development of language skills.

Dr. Orton[17] raised the question, stating: "One urgent practical question arises . . . how far is it justifiable to continue the special training in a particular child?" Pointing out the terrible handicap under which the non-reader must endure in our highly structured society, Dr. Orton emphasized that strenuous efforts are, indeed, appropriate to rectify such a deficit.

However, the recent studies which I have just discussed raise another question. They indicate that during learning to read there is a shift in visual processing of symbols. They suggest that we, in fact, have the capability of manipulating the organization of brain function. There appears to be some danger in an overwhelming preoccupation with learning to read. There exists the danger that in this preoccupation we may neglect to foster other skills equally important for that particular individual and for society. It highlights the obligation that we have to find and develop the assets of those whose liability is all too painfully evident and daily emphasized.

Suppose instead of choosing for my title "The Advantages of Being Dyslexic" I had, as I have suggested, termed this discussion "The Potential Advantages of Being the Kind of Person Who Might Have Trouble Learning to Read." In this connection a biographer of Einstein has the following comment:

> It is coming to be more widely agreed that an apparent defect in a particular person may merely indicate an imbalance in our normal expectations. A noted deficiency should alert us to look for a proficiency of a different kind in the exceptional person. The late use of language in childhood, the difficulty in learning foreign languages . . . may indicate a polarization or displacement in some of the skill to another area. That other enhanced area is without doubt, in Einstein's case, an extraordinary kind of visual imagery that penetrates his every thought process.[18]

Stimulated by this quotation I have reviewed a little of the history of this famous man with a language problem. The salient features appear to be as follows:

Einstein did not talk until he was three years old. Up until the age of seven, he had a serious language hesitancy—he appeared confused by speaking and would silently repeat after himself the words of each sentence uttered.

There were evidences of frustration in his early education. At the age of

five he had a special tutor for lessons and music. He had such a wild tantrum on one occasion that he threw a chair at his teacher; she left and never returned.

He was a mediocre student in early school and in the gymnasium at Munich. Having failed his language requirement, he left there at the age of 15 without a diploma. It was stated that he had a "disruptive influence on other students." At this time he also failed the language requirements for admission to technical school, and for that reason, sought supplementary education.

At this time, when he was 15 and 16, he went to a small canton school that placed special emphasis on individual study and development, and relied on visual methods of study. There are some indications that his training at this institution had a rather significant impact.

While he was at this school at the age of 16 he wrote his first known scientific paper entitled "Concerning the Investigation of the State of Ether in Magnetic Fields." It is of interest to consider the teaching methods adopted by this canton school, organized along the lines of the Pestalozzi method. Of this method Mr. Pestalozzi[19] had emphasized the following elements:

> Instruction has to follow the way of development. For the instructor the individuality of his charge should be holy.
>
> Conceptual thinking is built on visual understanding; visual understanding is the basis of all knowledge.

Within this school there was a minimum of verbal communication and a maximum use of diagrams, charts, maps and demonstration.

In regard to his own modes of thought, Einstein has the following to say:

> The words or the language, as they are written or spoken, do not seem to play any role in my mechanism of thought. The psychical entities which seem to serve as elements in thought are certain signs and more or less clear images which can be voluntarily reproduced and combined . . . taken from a psychological standpoint, this combinatory play seems to be the essential feature in productive thought—before there is any connection with logical construction in words or other kinds of signs which can be communicated to others. The above mentioned elements are, in my case, of visual and some of muscular type. Conventional words or other signs have to be sought for laboriously only in a secondary stage, when the mentioned associative play is sufficiently established and can be reproduced at will."[20]

In reviewing the history of Einstein's development, one is impressed with several circumstances which may have led to his unique achievement.

Unquestionably he was a unique individual—inner directed, strongly motivated, and with certain fundamental abilities.

At the age of four or five years his father showed him a magnetic compass. He became fascinated with this object, inquiring into the mechanisms which maintained its static position. He himself reported this as having become almost an obsession which directed his thinking for many years afterwards.

In his early years, even before the age of ten, it was quite evident that he was unusually skillful in the manipulation of spatial objects—puzzles and geometric puzzles, even such complicated ones as the Pythagorean theorem, which he was able to solve. At the age of 12 he was given a geometry book which is still available, marked and annotated, and which Einstein considered to have played a crucial part in his intellectual development.

While he was enrolled at the gymnasium in Munich a medical student, a friend of the family, gave him extracurricular reading such as "popular books on physical science, force and matter, and the 'Lehrbuch der Ebenen Geometry.' " Stimulated by such material he also read extensively in this field in the library.

Clearly the canton school which encouraged his type of thinking and which provided the opportunity for individual initiative arrived at a crucial time and permitted the evolution of his unusual and independent mode of thought.

From this review it almost appears that Einstein's development was made possible only by a series of fortuitous, almost trivial circumstances, occurring primarily outside of the framework of his formal education. How fortunate that his environment made this possible.

But to maintain a true perspective in this fascinating history, we must not forget its unsung hero—someone must have taught him to read.

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Neuropsychological Aspects of Reading and Writing

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I

There continues to be a poverty of systematic knowledge concerning the processes by which children learn to read and write. Yet there is a crucial need for such knowledge so that a body of generally accepted educational principles and procedures may be established to prevent and treat reading disorders which occur in approximately 15 percent of our child population (1). Reading and writing skill development involves complex processes of learning. On a physiological level, the nervous system is the basis for such learning. Undoubtedly, learning itself is a psychological process and should not be reduced to physiology. Yet to ignore the role of brain structure and function as fundamental to learning theory is to build an abstraction devoid of essential mainsprings.

In the past few decades, investigation into central nervous system functioning has provided important findings that should influence our thinking about how children learn. Investigations in neurology and psychology can be put to viable use in the teaching of reading and writing. This article will attempt to establish educational principles based on a logical relationship of process in these two related fields.

While there have grown up in Western Europe and the United States several traditions of neuropsychological and psychological thinking about language based on the structure and functioning of the brain, the neuropsychological model of reading and writing skill acquisition we shall describe is based on the theory of the development of complex functional systems within the brain. This theory was first promulgated in the Soviet Union by L. S. Vygotsky in the 1930's (2). It was richly elaborated and brought to international attention by Aleksandr R. Luria (3), Professor of Psychology at the University of Moscow. For almost 40 years, Luria and his associates have investigated brain-behavior relationship based upon the theoretical formulations of Vygotsky. Concentrating in the area of language development, they

yield a theoretical basis for understanding the problems of reading disorders. This illuminating work is far too little known among persons working in the language field, and calls for our careful attention. Part II of this article deals with the implications of this theory for the teacher, with special reference to educational principles and procedures recommended for the prevention and treatment of reading disorders.

There is today a plethora of approaches and methods in the teaching of reading. The rationale for this diversity rests in children's individual "learning styles." But should we not recognize that over and above individual "learning styles" there also exists a far more fundamental commonality of learning mechanism based upon human neuropsychological processes, a commonality of learning process that will have to account for individual differences as well? It is this basic commonality of neuropsychological learning process with which Vygotsky and Luria concern themselves.

Theoretically, Luria rejects both the centrally-controlled theory of intelligence as well as the environmentalist view. The former views intellectual capabilities as existing for the most part in the gene, unfolding in the course of a maturational development, and representing an over-all unitary quality of mind termed intelligence, capable of being measured by psychometric tests. This view ascribes to classes and races of people inferiority or superiority of intelligence based largely on biological considerations as measured by these tests. Luria has rejected this position as being unscientific.

In the second view, the relationship between stimulus and organismic response provides the central question for study. Internal mediation is ignored or is seen as computerized information processing. In such a model, the brain and the psychological processes it produces are not considered and the phenomenon of consciousness is completely banned. Thus, environmental stimulation acts upon a passive organism which incorporates input and returns response in accordance with contingency patterns.

The third model is in contrast with both the exclusively deterministic genetic view and the purely environmental one, especially that emphasizing operant conditioning and its elaboration to cover all behavior. The view, with which we are here concerned, is the developmental-interactionist model. Despite important differences among such proponents of the developmental-interactionist model as Jean Piaget, Jerome Bruner and L. S. Vygotsky, there exists the basic agreement that children's intellectual abilities are not innately determined but are developed throughout life in the process of interacting with environmental stimulation. Piaget's view of intellectual development involves a rather abstract and formalistic logico-algebraic model of structural

operations (4). Whether or not this distorts the process of intellectual development by forcing it into categories of formal logic, it does tend to minimize the social-historical role in the developmental process. Applied in broad outline to education, his age-normative theory of cognition would characterize methods of education as most effective when they are attuned to spontaneous thought patterns maturationally natural to a child's age (5). On the other hand, Bruner agrees with Vygotsky's central concept that intellectual development is the *result* of learning, is dependent upon it, and follows it. In his introduction to Vygotsky's *Thought and Language*, Bruner comments in approving terms on Vygotsky's "conception of intelligence as a capacity to benefit from instruction and on his radical proposal that we test intelligence accordingly" (6). Such testing purports to tap the quality of the learning process rather than merely its results.

Before his death in 1938, Vygotsky formulated a theoretical system to explain his evolutionary view of the learning mind. He related intellectual development to the process of learning. "Learning," he said, "is not itself development but correct organization of the child's learning leads to mental development, evokes a whole number of processes of development which could not take place without learning. Learning is an internally necessary and universal moment in the process of development in the child not of natural but of historically formed human characteristics" (7). Vygotsky went on to postulate a theory of functional learning systems in the brain that would explain the formation of such mental processes psychologically. Luria continued within this theoretical framework further developing Vygotsky's model of complex functional learning systems (8). These systems are formed in the brain on the basis of the child's communication with adults in the process of learning. They embrace different levels and different components each making its own contribution to the final structure of mental activity. Brain-behavior process has since become elevated within the past thirty years to a neuropsychological science. As one of its pioneers, Luria often points to the contributions of Pavlov as providing the historical progression basic to his own work.

What are these seminal neurological conceptualizations derived from Pavlov's work? Pavlov considered the conditioned reflex to be the neurological basis for all learning, both animal and human. It is unfortunate that western psychology has for the most part limited its concern with Pavlov to his experiments with dogs. His later studies with higher cortical functions provided the neural action for human psychological theory.

Pavlov's original studies involved the simultaneous presentation of meat

(the unconditioned stimulus) with the sound of a bell (the conditioned stimulus) to a hungry dog. The dog's instinctive response to the meat was salivation. After a number of reinforcements of the paired stimuli, the dog salivated in response to a bell without the meat. Direct connections had been formed between the visual and olfactory centers of the brain mediating the meat stimulus, with the auditory center mediating the sound stimulus of the bell. We must not underestimate the profound significance of this simple pairing of stimuli: a neural connection was formed in the brain where there had been none before. The bell took the place of the meat in eliciting the same response, and became the signal for the meat. It then became possible to pair other neutral stimuli with the conditioned stimuli to develop chain connections within the brain. The complexities of such associations become enormous. On an animal level, concrete and direct sensory signals evoke conditioned reflexes. Pavlov called these the "first signal system." He postulated that this same process also applies to human beings. In humans, concrete sensory signals are also able to evoke conditioned reflexes on the first signal system level. However, his great contribution to the psychology of human development and learning was his theory of the second signal system involving language. For human beings, language could be used as signals to evoke conditioned reflexes (9).

Pavlov's views have often suffered by being interpreted in a narrow context as simply a stimulus-response approach to nervous behavior. But interpreted in a broad, methodological manner, his theories have been most fruitful. For psychologists like Vygotsky and Luria, they acted as the point of departure for further neuropsychological development of human learning processes. Vygotsky believed that the elementary direct activity of the first signal system was replaced in the human being by complex functional systems formed in the process of communicating with others. He stressed the role of language as the basic tool in forming and developing intellectual ability in the child. If the child is not helped to develop the complex intellectual uses of language, he may become limited to its more elementary communicative functions alone. Thus, language becomes the vehicle by which consciousness develops and the means by which the child reflects the cultural heritage of the society in which he lives. From this powerful concept stems the inevitable conclusion that consciousness itself is neither spontaneous nor autistic but must be functionally linked with our social environment in its development. Learning must then be a social-historical process. For the functioning of the human brain, it is necessary to go beyond the organism itself and study its

activities historically within its social environment. What was essentially an instinctive physiological process in first-signal system animal learning becomes transformed qualitatively into a psychological and social-historical process in human learning.

After Vygotsky's death, it was left for Luria and his associates to carry forward this theory more vigorously and to study the course of mental processes: of perception and memory, of the organization of movement and action, of speech and thought. Working in the field of brain science, these scientists found it necessary, not only to study the extent and location of brain lesions, but also the activities of the normally developing individual historically, especially in his communication with others. For this, they were forced to analyze the developmental nature of language, of speech and thought, of reading and writing (10).

In his study of the brain itself, Luria rejects the theory that the brain works as an undifferentiated whole. Nor does he believe in the narrow localization-of-function theories, namely that there exist disparate nerve centers responsible for complex psychological functions. He approaches the human brain in a broader definition of function as a complex developing system which includes joint work of different levels and areas, "a working constellation," as it were. He singles out three basic cooperating blocks of the human brain. The first, which he calls the "block of energy and tone," includes the upper brain stem, the reticular formation and to an extent, the oldest parts of the limbic cortex and hippocampus. The forms of activity of this block are responsible for regulation of the general state, the tone of the cortex and control of the motivational-emotional mechanisms. The systems of the first functional unit not only maintain cortical tone but are themselves influenced by the differentiating activities of the cortex. The first functional unit works in close cooperation with the higher levels of the cortex.

The second block of the brain is defined as that of input, re-coding and storage of information. It includes the posterior parts of the hemispheres with the occipital, parietal and temporal regions and their underlying structures. It is commonly accepted that the systems of the second block are highly modality specific. The occipital lobe is the central area for visual analysis and does not participate in the decoding of symbols. The temporal lobe is predominantly involved with auditory analysis and the parietal lobe with differentiated types of motor functioning. The organization of the structures which form this system is hierarchical. These structures can be subdivided into primary or projection areas upon which corresponding information is

registered and analyzed into its elementary components, secondary or projection-association areas which coordinate the working of the various analyzers and produce symbolic schemes which are the basis for cognitive activity. Patients with lesions in the posterior parts of the brain may lose certain behavioral operations, but never a deterioration of their conscious conduct. They remain fully aware of their defects and attempt to compensate for them. This description is strongly reminiscent of Orton's analysis of the neuropsychological bases of the language function (11, 12, 13).

The third block of the brain includes the frontal lobes, which occupy nearly one third of the hemispheres. They represent the last acquisition of the evolutionary process and are sometimes called the "new brain." The frontal lobes have close connections with the motor cortex and with the structures of the second block. Their work, however, is not modality-specific and does not mature until the fourth or fifth year of life. This block is believed to play an important role in the realization of plans and programs of human actions and in the regulation, verification, and control of human conscious activity, all of which are formed on the basis of speech and language (14). The coordinated actions of all three functional units of the brain are necessary for perception to take place. The first provides the cortical tone and motivational-emotional component; the second carries out the analysis and synthesis of incoming information and the third provides the programming and feed-back.

The theory of the development of functional systems within the brain resulting from the child's relations with his social activities provides a foundation for a psychological theory of perception geared to analyzing and remediating a child's language problems. More broadly, it can serve as the frame of reference for a new theory of education directed toward the *formation* of abilities resulting from the educational process. Though Vygotsky includes the child's total social activities as instrumental in developing mental abilities, he emphasizes that the mastery of socially determined experience is best carried out systematically in a well-organized school.

While Luria has analyzed the functional organization of the brain, he has also gone outside the brain to study the complex structure of language and the interactions of the two (15). His discussion of reading and writing as an integrated process, developmentally progressing through various stages, should be of particular interest to educators. He recognizes that the reading process differs with different languages. For example, a largely non-phonetically symbolized language such as Chinese is not dependent on auditory decoding. The conventional symbols of the Chinese language do not record the phonetic

composition of words but rather ideas and concepts. In analyzing such logographs, we find that it is the visual modality which is principally used and therefore developed. Western road signs are an analogous form.

On the other hand, English, which is essentially a phonetic language, should be approached in its initial stages through the auditory channel (16). The perception of the word must be seen as a composition or construction of sounds. In a detailed analysis of this auditory process, D. B. Elkonin refers to this construction of sounds of a word as its "sound structure," which he defines as its organization of sounds in their temporal sequential order. This organization of sounds results from the synthetic activity of the cortex in which separate phonemes are recoded into a single dynamic unit. Thus, a variety of activity of phonic forms synthesizes into what Pavlov earlier termed a "dynamic stereotype," in the process becoming automatic through practice (17). In the course of its automatization, the detailed cycle of operations involved in decoding is gradually contracted and simplified. Eventually, it is transformed into the direct recognition of words by sight that characterizes the experienced reader, giving it the appearance of an easy, simple process.

It follows from Luria's process analysis that without mastering the process of blending sounds into words, the child is forced, if he can, to compensate by finding alternative channels for learning. Usually the alternative process becomes the visual approach to the whole word, associating it immediately with meaning as if it were a logograph. This approach leans heavily upon visual memory processing. Many children, including pre-schoolers, do learn to read by the sight approach quite well, internalizing necessary phonic generalizations in a form of self-directed learning. These children are still hampered in other structural language areas, however, by their inadquate auditory analysis and synthesis development. The method of teaching reading must be seen not only in terms of the immediate results in the reading skill, but also in its broader aspects of its effect on the development of spelling, writing, and speech articulation. It is therefore apparent that with an essentially phonetic language, the role of phonic elements and the correct sound structure of words should be explicitly taught. To by-pass the development of auditory perception by failing to teach phonics systematically is to deprive the child of the keys to language. Advanced reading and writing skills should follow only after children have obtained and made automatic the decoding process.

After the stages of decoding, the word becomes transformed into the

meaning of the object or action denoted by it. However, this transformation of words into thoughts is not a passive process. The reader grasps the meaning which evokes in him a particular system of associations or a kind of hypothesis. In turn, this hypothesis creates the basis for making the subsequent reading an active search for the desired meaning which agrees with the reader's expected meaning. Normally, this process of comparing the expected meaning with that actually expressed is rapid and adaptive so that a hypothesis that does not correspond with the true meaning is immediately inhibited and corrected. Should the system of associations be inadequately developed, however, the hypothesis may fail to be corrected. In this way, the child relies on "guessing reading." The guessing aspect of reading should and can be overcome by helping him develop stable associations of word patterns and their meanings in the early stages of reading and providing immediate feedback on whether his guesses are appropriate.

While the process of reading follows the paths of words to thoughts, the writing process follows the opposite path of thoughts to words. However, both require the processing of acoustic continuity of speech. In phonetic languages, writing begins with the analysis of phonic elements that go to make up the pronounced word as in reading. Again as in reading, where phonemic hearing is inadequate for subtle discriminations, it must be developed through appropriate training. Experience with beginning writing skills has demonstrated that articulation plays an important part in precisely defining the phonic composition of words. An elementary expanded form of articulation is used by children just learning to write. At this stage they speak the words aloud, which is the motor component of their phonic analysis. Such articulation of phonic forms is then recorded into graphic forms directly mapped to the audible ones. In writing, as in reading, children learn to preserve the correct sound sequence. With experience, the overt articulation becomes transformed into silent and unseen articulatory movements of inner speech.

The next stage in writing, the recoding of the phoneme into the grapheme, is not a simple one. Each letter has its individual visual-spatial structure. The child with a poorly developed sense of space relationships of written sumbols stemming from his own confused sense of direction in space, will have difficulty writing legibly. To prevent illegible handwriting, visual-motor training is necessary in the form of breaking down the visuo-spatial structure of each letter and helping the child reconstruct each stroke in its appropriate spatial position.

The final stage of writing no longer involves phonemic discrimination or the study of spatial relationships basic to grapheme representation. Through practice, writing becomes by degrees a highly automatized action resulting in a complex motor stereotype. The skilled movements of the hand are eventually able to produce the "kinetic melody" of the experienced writer (18).

Basing himself on the investigations of Luria, A. N. Sokolov (19) relates the progression of these stages in learning to write to their neuronal connections. He describes a constellation of joint activity of at least five areas of the cortex as being necessary for initial learning of writing.* The cortical activities he enumerates take into account only the writing activity. Certainly the brain areas assigned to Block I by Luria dealing with energy and tone are involved. The subcortical structures which mediate motivational and affective aspects of the writing performance may psychologically orchestrate the emotional effects of success or failure in the task.

Written speech, both in its motor patterns of handwriting and in its power to harness thought has been profoundly underestimated. The unfettered associations of pre-conceptual thinking of the small child are molded and given logical meaning as they develop the syntactic structure of written speech. Vygotsky believed that written speech "calls to life a wholly new, very complex course of development of mental processes and that the advent of these processes signifies an essential change in the child's general mental traits, just as the learning of speech marks an essential stage in the transition from babyhood to early childhood" (20). It is in the skills activities in which the child engages in learning to write that the functional systems or the constellation of joint activity described by Sokolov are developed. By the same token, it is precisely the type of skills activities in which the child has been engaged developmentally which also determine his individual "learning style." Individual learning styles in children are not innate, nor do they relate to modalities or channels per se—an error of generalization often made. A

*1. Centers in the auditory cortex where auditory analysis and synthesis of speech takes place.
2. Premotor cortex where kinesthetic impulses are intitiated necessary for articulation of words during writing.
3. Left parietal-occipital cortex which does the recording of phonemes into graphemes.
4. Pre-motor cortical area which carries out the recoding of graphic schemes into smooth "kinesthetic melodies" of the motor act of writing.
5. Frontal area which exercises control over the overall program of the writing process and ensures the inhibition of extraneous associations.

child's visual-motor perception may be quite practiced in drawing pictures and undeveloped in handwriting. One reading method may develop auditory-vocal connections (phonemic hearing) to a very sensitive degree, another kinesthetic-motor mastery. What is indicated here is that "learning styles" depend on functional connections resulting from activities exercised within methodologies. What is implicit in how "learning styles" are developed is that reading and writing methodology assumes an unexpected importance. Methodology appears to be dominant in determining how and which functional systems develop within the child's brain.

The fifty-year-old controversy between the "look-say" or sight approach to reading and the phonic method can be analyzed from the point of view of functional systems. For many years, the sight method dominated teaching methodologies, while the phonic method was almost universally discouraged. During this period, visual perception was developed at the expense of the auditory. Functional systems became richly sensitive to the sight of whole words relating these to their meanings. The word was learned much as the Chinese logograph was learned—globally and visually. Auditory perception for word sounds remained untrained and undeveloped. Many children who were able to internalize the sound-symbol relationship through self-directed learning became successful readers. Many equally intelligent children did not. But it was common knowledge that of those who did learn to read, a larger percentage never learned spelling or writing very well. Not all the functional systems necessary for the reading and writing processes were being trained to function jointly in a "working constellation".

For the most part, Luria's studies deal with human perception and cognition. His work with the complexities of the affective domain, he leaves for another time. In all his writings, however, he does stress the close interconnections between the two areas of functioning on neurological as well as psychological levels.

In practice, we have institutionalized the separation of these two areas of functioning. We have grown accustomed to the separate fields of "mental health" and "education": that the child's cognitive development is the business of educators, his emotional life that of the mental health team. Each discipline conceptualizes the child's development in different terms, describing different dynamics. Dichotomizing the child merely results in different diagnostic labels and treatment practices. Is the child labelled "emotionally disturbed" or "learning disabled?" Should he be referred for language remediation or psychotherapy? In a child whom the schools have

failed, the fear of the learning situation often becomes generalized into fears and phobias in other situations. The patterns of aggressiveness or withdrawal which ensue often resulting from the child's sense of failure, in turn produce tension and inhibit further learning. The most effective treatment for such children is to reverse the psychological direction of failure with experiences of consistent success in the learning situation. Under appropriate conditions, such educational treatment is within the province of a good teacher.

II

What are the implications for the teacher of the neuropsychological model developed by Luria and his associates? It should be apparent that it is not possible to be a good teacher and harbor negative and punitive attitudes. These attitudes can only create tension and rigidity in the teaching situation. Nor is it possible to be a good teacher while following a "poor" method. If we define "poor" as fragmentary, non-sequential, or an overloading hodge-podge of tasks ignoring phonic pre-requisites, it will be impossible for many children to learn to read and write well, no matter how well intentioned or caring a teacher might be. A teacher must be able to honestly expect the child to learn to read and write, and with appropriate methodology, this is a realizable expectation with most children, regardless of home environment. The role of methodology as it relates to process is crucial. What, then, should she look for in reading and writing methodology?

First: Organization and Sequence. To prevent reading problems, beginning methodology should provide for sequential activities which build in "dynamic stereotypes" or structural patterns providing the phonic keys to the language. Such systematic organization will lay the basis for the formation of internal developmental organization not only in the reading skill but more broadly in language structure (21).

Second: The Intersensory Principle. This intermodal principle is basic to the prevention of reading failures and to their remediation. At every step of the way, the constellation of neuronal connections necessary to effectively mediate the language skills demand the integration of the visual, auditory, and kinesthetic-motor channels. When systematically done, psychological processes are established which strengthen associative connections and insure retention. A practical way of implementing this intersensory principle is to teach reading, writing, and spelling simultaneously with the same vocabulary.

Third: Phonic Analysis and Blending. Such methodology should be built

upon phonic analysis and blending making use of linguistic principles (22). Spelling-sound correspondence is more effective in structuring reading material than relating words to their meanings in a whole word or sight approach which comes later in the hierarchy of reading stages. Spelling-sound correspondence insures the synchronized organization of the temporal and spatial sequence of sounds that go to make up words. On the other hand, global word training is inappropriate as a beginning method because it ignores teaching the child to analyze word structure. Children perceive words by analyzing the letters in them and relating these to their sound structure. Trained to perceive words globally, they are able to pick up only parts of words as cues, (usually the initial and final letters) and guess at the whole word, often incorrectly. To have to base their guesses on inadequate letter cues with inadequate reference to sound structure tends to create confusion as well as insecurity and anxiety.

Special Education has long been aware of the need to train perceptual-motor functioning as a basis for learning the academic skills. It has been the belief that engaging the child in such activities as balance-board walking, peg-board activities, puzzles, mazes or non-sequential word games would provide that perceptual training. Derived empirically over the years, it has been our belief that such activities effect poor transfer to language skill development. Methodology which follows Luria's process analysis would employ the type of perceptual training that is built into the teaching of reading and writing as sequential steps within these processes. The theory of the development of complex functional systems would emphasize the view that transfer of training can best be effected through hierarchical training of the skill rather than through indirect or generalized perceptual-motor training. Hours practicing motor-development on a balance board may train a child to become a good tight-rope artist, but will have only peripheral relevance to the type of motor development needed to learn reading and writing skills.

When a child is systematically trained in phonemic hearing and taught phonics, he simultaneously actively develops his auditory perception and memory for the sound structure of words. When he is carefully taught handwriting skills, he simultaneously develops his visual-motor coordination and memory for symbolic recording. When a child is engaged in appropriate learning activities, he thereby lengthens his attention span for academic work. When sequentially taught language concepts, he is helped to organize his thinking and writing. When he is taught systematic number relationships, he

develops logical mathematical reasoning. When these skills are task-analyzed and the steps taught sequentially, perceptual-motor training is thereby built into skill teaching. Certainly generalizations take place in the developmental process and qualitative leaps occur that enable the child to enter new stages of maturity, but these are the *results* of hierarchical learnings. They only appear to happen spontaneously. Despite poor teaching, a process of compensation may take place in which the child, through self-directed learning, successfully manages to make his own generalizations and rules from inadequate cues and "does it his own way." Often, however, "his own way" is less than adequate to learn the literacy skills and to meet the intellectual demands of the school.

Our belief is that a more realistic philosophy is emerging in the way we view children's learning. After more than a decade of analyzing children's learning difficulties, we are forced to look to the role of the schools as an important causative factor. Backwardness in children's language and learning development is too often the result of deteriorated school programs. We do not refer to the relatively small percentage of children who, indeed, do have aggravated neurological dysfunctions and who need specialized structured programs ("specialized" only in the sense that the hierarchical stages of learning must be broken down into smaller steps, more intensively reinforced). We refer, rather, to the large numbers of average poorly-schooled children without functional reading and writing skills who have a normal potential. With appropriate methods and conditions of remediation they would be able to develop into completely productive adults. Since these children's problems, often labeled "learning disabilities," are neither permanent nor unremediable, it is within the responsibility of educators to develop effective programs that will counteract the hidden but disastrous effects of poor schooling.

In describing Luria's neuropsychological theory in relation to reading and writing, it has been the attempt of this article to generalize from it the fundamental principle that the role of formal education is not to elicit what is claimed to be there in the child, nor even to develop skills. Rather, it is the most profound function of education to develop the child's intellectual abilities, of actually forming these abilities in the context of his social realities. Vygotsky believed that the mastery of socially determined experience changed not only one's ideas of reality but also developed these mental abilities, and in so doing, created a more solid structure for the conscious activity of man. While he included the child's total social activities as

instrumental in developing mental abilities, he emphasized that such mastery is most effectively carried out systematically in a well-organized school (23). The social responsibility of the school is to contribute very fundamentally to the intellectual and personality development of the child. If it succeeds in doing this, its children will mature into productive and intelligent citizens alert to the need for ever-developing democratic processes of social change. If it fails, let us look for the fault not within the child but within the inadequacies of our society and especially within our schools.

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The Study of Dyslexia: Two Nascent Trends and a Neuropsychological Model

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Two fields of inquiry into the language function which have obviously parallel aspects are those concerned with aphasia and with dyslexia. This has often been pointed out in the literature of neurology; some recent comparisons with significant implications are considered in this paper.

A review of dyslexia was published recently (Benton 1975). [See Reviews below. Editor.] While it did not point to the growing trend to investigate dyslexia *vis-à-vis* hemispheric specialization, that trend is well established. Examination of the subsequent literature revealed two trends that will probably become well established. That is why the term "nascent" is used. One trend is phenomenological; the other, developmental. Both are fundamental to progress in understanding dyslexia and in the relation of lateralization of function to dyslexia. Analysis of what appears to be the direction that some of this research is taking and analysis of what seems to be the concepts of brain organization underlying this direction led to the suggestion of an alternate neuropsychological model. This somewhat different way of looking at the brain in development is offered in order to provide a rationale for integrating and extending these important trends.

Controversy continues over the definition of dyslexia, whether it is unitary or not, and even its existence. An additional element to the older arguments is the idea of dyslexia as a variant of minimal brain dysfunction. This idea was put forth explicitly by Wender (1971) and has been followed in recent studies (Mattis et al. 1975; Denckla and Rudel 1976). A glance at the state of aphasiology is instructive, reassuring and directing. Noted investigators of aphasia have recently written:

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> We must all admit that the field of aphasiology has failed to resolve its most fundamental problem; we have failed to discover a single precise characterization of aphasia that serves the purposes of all the sciences concerned. (Jenkins et al. 1975, p. 49)

This description is equally true of dylsexia, and we attempt here to bring this similarity into sharp focus.

Aphasia has an advantage over dyslexia. Its investigators all seem to agree that the phenomenon exists. But there is sharp disagreement about whether aphasia is singular or plural, whether there are distinct subgroups or only variants of one entity. Similar disagreement exists in the study of dyslexia.

A recent definitive British study has provided evidence that dyslexia, in one of its root meanings which pertains to reading, does exist. Rutter and Yule (1975) have shown by sophisticated and excellent methodology and analysis that specific reading retardation is a distinct phenomenon. They call it specific *reading* retardation and that's the rub. There is a residual controversy in Britain over the name and whether its referent is singular or plural (Rutter and Yule 1975; Critchley 1976).

It should be clear, as in aphasiology (Jenkins et al. 1975), that the controversy can only be settled by research. It cannot be settled by fiat. Nothing in science can. The answers are not likely to come quickly. The mistake would be to expect that they will do so and to lose interest when they do not.

Since the name dyslexia is used throughout this paper, the reader needs clarification as to its use. The papers to which extensive reference is made have used the term in title or body. Where there is an exception, it is made clear. Reference to minimal brain dysfunction (MBD) is made where it has been used in Wender's sense, with dyslexia as a sub-variant, and where the dyslexic aspect is of main importance. In the theoretical discussion dyslexia is used to mean at least specific reading retardation where the reading difficulty is discrepant from expectation.

Two Nascent Trends

Phenomenological Trend

Phenomenology can be defined as a branch of any science that deals with the description of the phenomena within the scope of that science. It is used

here to refer to the description of the main phenomena in dyslexia, the reading and language behavior of dyslexics. It is by the former, by definition; and the latter, by some consensus that the target population is identified (e.g., see Rawson, 1975, on how dyslexics differ from the general population). It seems curious that with the already huge, and increasing, literature on dyslexia so little research effort has been spent on its phenomenology (Turton 1975; Wiig 1976). The main reason seems to be the eagerness of investigators to uncover underlying causes. This desire has produced a literature which has more to say (pro and con) about a great variety of correlates than it has to say about the nature of the commonly presenting complaint itself, reading failure.

There is a nascent trend to investigate language performance experimentally and with some linguistic sophistication. Syntactic deficiencies in oral language were reported in a sample of 7 to 8 year old dyslexic children compared to normal matched controls. Deficits were found in recognition of melodic pattern in speech (declarative vs. interrogative), in sentence repetition of a series of sentences with increasing syntactic complexity, and in syntax and morphology in expressive language (Vogel 1975). Dyslexics, 8 to 11 years old, were found to have the longest latencies and largest total error scores on a naming task of object drawings compared to a matched non-dyslexic minimal brain dysfunction (MBD) group and to normal controls (Denckla and Rudel 1976). Of particular interest in this study is the distinctive nature of the errors made by the dyslexic children. When they could not name the drawings, they gave what the authors termed "circumlocutions"; that is, they gave correct descriptions of the stimulus pictures. When they gave an incorrect name it was a phonetic or associative "shadow" of the correct name, e.g., *styraphone* for *xylophone*. The incorrect names given by the non-dyslexic MBD group had no apparent linguistic relation to the stimulus. Adolescent linguistic performance of what are called learning-disabled children has been intensively investigated by Wiig using large batteries of tests (Wiig 1976). Commenting on and summarizing several years of work, she concludes that both language processing and language production abilities are quantitatively, not qualitatively, different from normals. However she reports, as a distinctive language deficit, a dysnomia in her subjects. The experimental group's naming errors were associative word substitutes suggesting that they could identify the abstract categories but were unable to provide the precise names. Wiig's result is reminiscent of the circumlocutions reported by Denckla and Rudel. It raises the suspicion that a large portion or

all of the adolescent groups labeled learning disabled was very similar in nature to the group labeled dyslexic-MBD by Denckla and Rudel despite differences in selection criteria.

While the above studies suggest a trend toward investigating the linguistic performance of the dyslexic, there is no parallel trend in evidence with respect to the phenomenology of the defining symptom, reading deficit. Of its real nature we know virtually nothing, just as we know very little about the nature of the process by which normal children learn to read (see Calfee 1975).

Developmental Trend

By common agreement (whatever the disagreement about dyslexia) we are studying a symptom or disorder or deviance that appears in children. It is a commonplace that children develop. Development means, at least, change with time. Yet the literature on dyslexia is generally characterized by statements that dyslexia is or is not a memory deficit, attentional deficit, visual-perceptual deficit, visual-motor deficit, cross-modal deficit, cognitive deficit, etc., based on samples of one or at best a narrow range of age groups. A systematic developmental research approach has not been characteristic. The need for longitudinal studies has long been recognized. A few have appeared. One of the most important of these has changed opinion about the prognosis for dyslexics (Rawson 1968; compare Critchley 1964 to Critchley 1970). It is the nature of scientific activity, particularly in our time, that more work on an issue is produced when a framework, model, or theory has been explicitly stated for the research community.

In the early 1970's such a framework came into focus. Increasingly formal statements were made about viewing dyslexia in a developmental context. It was suggested that the factors that cause reading difficulties vary with the age of the child; the limiting conditions within the child change with age as the child develops (Satz and Sparrow 1970). An argument was made for the utilization of the developmental psychologist's methods of analysis (Kinsbourne 1973). Denckla proposed the use of what she termed "neurometrics." "Neurometrics" was defined as quantification of observations based on developmental norms that not only reveal the ages at which milestones of development are passed, but also show how well a child performs on a task compared to other children of his age when he has passed a given maturational milestone (Denckla 1973a). Examination of the literature of 1975 and

1976 indicates that these suggestions are beginning to produce a true developmental trend in research.

The common model shared by these investigators is based upon the notion of maturational lag (or developmental delay or neurodevelopmental lag or any combination of these terms). Maturational lag is defined as performance or behavior during development which looks like the behavior of a younger child. Performance is of the *same nature* and in the same developmental order as that of normal children. The single differentiating feature is that it is typical of the younger child. Kinsbourne states:

> . . . the diagnosis of minimal brain dysfunction (MBD) is based on findings that are abnormal only with reference to the child's age. If the child were younger, the findings would be regarded as normal. They indicate a relative delay in some aspect of neurological maturation as a result of slowed evolution or cerebral control of the relevant activity. (Kinsbourne 1973, p. 268)

Although in the above quotation Kinsbourne refers to MBD, he was also referring to children whose presenting complaint was reading failure not hyperkinesis.

Maturational lag as an explanatory concept is not new in the literature. Previously it has most commonly been invoked in the discussion section of studies that were not determined by the concept. In such use, it served a quasi-explanatory function on analysis more indicative of what is not known that what is. These tendencies have led at least one reviewer to dismiss the term as a "mere slogan" (Benton 1975, p. 38). There are two things that are new in the present use of the notion. It has been explicitly formulated as a theory with explicit research implications, and it has served to guide research, forming the starting point of research projects (see Satz et al. 1974, 1975, 1976; Denckla 1973b, 1974).

The most explicit theoretical statement is made by Satz (1974, pp. 176–177):[1]

> The theory guiding the present research is that developmental dyslexia . . . is due to a lag in the maturation of the cerebral cortex (pri-

[1] Bender (1975) presented an interesting theoretical elaboration of the concept. Her formulation is not as restrictive as Satz's. It includes better than normal performance, an emphasis on difference, and is more compatible with the alternate model and its research implications which are delineated in this paper.

> marily the left hemisphere). This lag mechanism . . . is unobservable and thereby treated as a hypothetical construct. . . .

He stresses the developmental aspect of his model and the implications which have been used to form hypotheses for his research:

> . . . In other words, the theory attempts to conceptualize the reading disorder within the framework of a developmental model rather than a disease model . . . the process of this disorder should vary as a function of the stage and/or the chronological age of the child.

He further extends his theory of developmental dyslexia:

> The theory, in brief, conceptualizes developmental dyslexia as more than a reading disorder *per se*. That is, the disorder is explained as a *delay* in those crucial early sensori-motor and later conceptual-linguistic skills which are intrinsic to the acquisition of reading and which are triggered by a lag in the maturation of the cerebral cortex.

The critical implications which have guided Satz's research are amplified by his statement of the postulated brain mechanism: ". . . the theory postulates that the brain-lag mechanism (genetic or otherwise) *merely retards* the sequential and hierarchical stages" (Satz et al. 1975, p. 108) [emphasis mine].

A true developmental approach to developmental dyslexia has been sorely needed. The predictive battery Satz and his associates have developed together with the battery of de Hirsch and Jansky (de Hirsch et al. 1966; Jansky and de Hirsch 1972) has expanded the ability to prevent the personal and social costs of dyslexia. Satz's data, in general, have provided important information and the next years of his project promise to supply more. Denckla's concept of "neurometrics" is novel and valuable. If widely accepted and implemented it will provide a crucial base of information with which to evaluate deviant children and better understand the brain mechanisms of both the deviants and the normals. The studies she and her colleague have generated represent a considerable contribution.[2] Since this theory has been so productive why look for an alternate model? The answer is that the

[2] In a conversation with Dr. M. B. Denckla during the writing of this paper, she indicated increasing doubt about the delay model which does not seem adequate to explain her continuing observations. It may no longer represent her current thinking.

model has inherent limitations which may be avoided by looking at brain in development in a different way. The research it has prompted is just as possible under the alternate model. The suggested model points to additional hypotheses that do not derive from this one.

Limitations of the Delay Model

The delay concept is sometimes used as if it were established fact; i.e., these children are different *only* because they exhibit behaviors characteristic of younger children (Kinsbourne 1973). There was not sufficient evidence to support it as established fact at the time and there still is not (see Wender 1971; Wender 1973; Benton 1975).

Such categoricalness (perhaps resulting from the brevity of the Kinsbourne communication) is not true of all its proponents. Satz uses the terms hypothesis and theory. He states his theory is disconfirmable and the answer will be in when the terminal data of his project have been collected (Satz et al. 1974). If his children show developmental acquisitions out of the normal developmental order, he will accept the findings as disconfirming.

There are more serious limitations to the theory and to research guided by it. The theory limits the kinds of observations made. While this is true of every theory, and is in fact a purpose of any theory, what is left out is precisely what must be known.

There is a tendency to age-limit observations. This tendency is partly due to the implication of catch-up. A developmental delay is most commonly understood to mean a temporary situation (Gerstman 1976). There is a lag for a time, a gap between the given capacity of the particular child and the capacity of the normal peers which closes after a while. Teachers of reading are advised to utilize other capacities of the child to teach him to read "... pending the maturation of the defective process" (Kinsbourne 1973). Not all writers cement the idea of catch-up to the idea of delay. Satz considers that the children may not catch up. If they do not do so by puberty, there may be permanent sequelae. (See footnote, Satz et al. 1975, p. 108). It is not merely a matter of how most people will read the term. Without the catch-up expectation, the theory loses not only its most generally understood meaning, but also its direction for research into later development. How does one proceed when no catch-up is discovered? How does one begin to ask questions about the permanent sequelae? The theory supplies no answers because it was not formulated with this outcome in mind. It was formed on the notion that the children are merely delayed.

There is some evidence that whatever underlies the difference does not catch up. The literature on MBD, while hardly conclusive on this point, suggests that some deviance is visible into the third decade of life (Denhoff 1973). It is not clear whether anyone has looked later. The literature on dyslexia continues the frequent observation that a spelling disability remains well into maturity (Rawson 1968; Critchley 1970, 1975). After long and intensive effort on the part of the sufferer to free himself from dependence on a reader for his writing or typing he is still saddled with what he feels to be a crippling disability. Dyslexic writing has been described as pathognomic and bizarre (Gallagher 1960; Walker and Cole 1966; Rawson 1968). How do we begin to try to unravel this with the concept of developmental delay? If for no other reason than default, the theory would tend to age-limit observation because it provides an explicit rationale for only a limited period of development. It contains no rationale for taking a long look at development.

This tendency is further strengthened by its associated notions of brain development. Brain is considered to be maturing until puberty. Available evidence supports this in large measure but there are important exceptions which may turn out to be crucial for the understanding of human development in general and dyslexia in particular.

The following is based on the work of Yakovlev and Lecours (1967). Anatomical study of myelogenesis of the growing brain shows that the fine network of the median region of the forebrain, as well as the brain stem reticular formation, continues development until *at least* the third decade of life, a time considerably after puberty. These regions have been associated with motivation, attention, and arousal and so may be a bit removed from the problem at hand.[3] More compelling is the point that the commissural and "association" systems of frontal, parietal, and temporal cortex have the longest cycle of myelination. These regions show exponential increase of myelinated fibers *up to senescence.* This is all the more dramatic given evidence that most other regions of brain complete myelination far earlier. And, these regions include those areas of cortex which have been implicated in language and reading. Clearly, there are parameters of brain development which do not end with puberty. In fact, it appears that in a non-trivial sense brain continues to develop until it begins to die.

Recent aphasia studies yield a somewhat similar conclusion (Brown and

[3] A hypothesis has been advanced about the relationship between reticular formation activity and MBD (Wender 1971, 1973). Wender is not the only writer to see dyslexia as a variant of MBD as indicated in the text.

Jaffe 1975; Brown and Hecaën 1976). The distinctive characteristics or "types" of aphasia seem age dependent, in addition to other recognized variables. Lateralization and cerebral dominance may continue throughout life. Brown and Jaffe (1975) argue for a life span aphasiology in order to really understand the nature of aphasia. The dyslexic child's permanent sequelae postulated by puberty if the lagging brain does not stop lagging may not be permanent at all. The above evidence suggests that in subtle ways they may change, much as do the associated correlates in childhood.

The major inadequacy of the theory concerns the way it limits the nature of the research it generates. It could incorporate a longer view of brain maturation and produce the same kind of research over a longer developmental period. It is instructive to analyse the kinds of questions this model suggests.

These questions concern what the child can *not* do that is age-appropriate. They are negative (or deficit) questions almost exclusively (and removed even in this respect from examination of the basic complaint, reading failure). Positive answers turn up mainly with respect to what catches up. Finger-localization, alphabet recitation and recognition-discrimination tasks are performed poorly in kindergarten. They are highly predictive of later reading difficulty, but these tasks cease to differentiate the poor from the normal readers by the end of grade two (Satz et al. 1975). The children have now caught up; we have some positive information. They are still very poor readers. Other lags persist. The dyslexic children perform more poorly than controls on a variety of other tests. We have more negative information. These data are useful as far as they go. They do not go far enough. This approach does not lead us to ask, "If they cannot do something, *why* can't they?" There is no analysis of strategies that might provide the answers. It does not lead us to ask, "If they can perform a task, *how* do they do it? Do they do it in the same way as the controls?" It does not lead us to ask, "Are there any tasks on which these children perform better than normal?" The first question is precisely the pressing question teachers ask. The second opens the door to the most probable and crucial disconfirming evidence. The third could not only provide additional disconfirming evidence but could also provide insight into the brain organization of dyslexics. The theory has no rationale for these questions because it is based on the premise of "normal for younger." It implicitly answers the questions before they are raised by assuming that when the dyslexic children cannot do a task it is for the same reasons that normal younger children cannot. When the dyslexics can perform it is for the same reasons that their age peers or younger children can.

Finally, a relatively static model of brain underlies the whole approach despite terms like *dynamic* and *reorganization*. It may be useful to ask, "Meanwhile, what is happening in brain while this selective and ontogenetically varying retarding is going on?"

A Dynamic Developmental Differences Model

The hypothesis underlying the suggested model is that we are dealing with brains better described as different than delayed. Sladen (1972) suggested that there may be certain advantages associated with dyslexia, i.e., better than average capacities. Symmes and Rapoport (1972) found clear evidence of superior spatial abilities coinciding with reading retardation. Symmes pointedly interpreted her results within a difference framework even though her subjects had a reading deficit and suggested that similar observations may go unnoticed by other investigators who are biased by a deficit conception (Symmes 1972). Whether the long term difficulties reported for adult dyslexics coincide with positive differences (better performance) similar or analagous to those found by Symmes and Rapoport is unknown. These difficulties are usually subsumed under the phrase "permanent sequelae." The phrase represents what is seen grossly, that is, under the lowest power of magnification, and only what has been looked at. Some aspects of brain development appear to continue virtually over the whole life span. Given the varying nature of the correlates during childhood, there is reason to suspect that an analagous variation may be hidden under the reported sequelae.

Extending the time scale downward, there is some indication that there are brain differences very much earlier than kindergarten which are related to reading achievement. For example, Matheny and Dolan found deviant sleep characteristics (which were not related to I.Q. or I.Q. sub-tests) to be related to reading measured at age 10. Interestingly, since the differences in this example refer to sleep characteristics, the brain stem reticular formation is implicated.[4]

If the time scale is extended in both directions, it is suspected that

[4] The Matheny and Dolan study was cited as an example, for two reasons. The investigation of sleep disturbances in relation to reading achievement is novel and interesting. Cortex is the fondest location for hypotheses about the substratum of dyslexia. It is useful to be reminded that brain is a complex system and that other regions are involved in all its activities (see Joynt 1975, for the relation of thalamus to language).

changing manifestations or correlates will appear all along this extended scale. This is what should be true if what is involved is a different, developing brain. It is possible to stretch the delay hypothesis to cover this extended range, as indicated earlier. However, the ways that the delay model limit the kinds of observations made, suggest that an alternate developmental model is preferable. For heuristic purposes, the dyslexic is viewed as having a different brain. It is expected that the differences are subtle, but detectable. The difference model implies all the hypotheses of the delay theory and implies hypotheses that would not follow from the delay approach. Upon what view of brain organization does this suggested model rest so that other hypotheses follow? Some of the points in the succeeding outline of brain organization are similar to the delay model. The net neuropsychological view is not.

Brain is a self-organizing system (Lashley 1949; Jenkins et al. 1975). It iteratively re-organizes itself during development. As a skill develops, the underlying psychophysiological structure of the skill changes (Luria 1966). Higher mental functions change in an essential way during ontogeny and with training (Luria 1973). Normal development for some higher functions may continue well past puberty and even over the life span. It follows that re-organization of higher functions may occur over the life span. Brain re-organizes itself when damaged and in the direction of the greatest amount of adaptiveness possible (Lashley 1929; Luria 1973; Jenkins et al. 1975). What causes such restoration of adaptiveness is one of the leading neurophysiological issues and it is not restricted to the young, plastic brain. One of the important mechanisms involves the use of different behavioral or cognitive strategies (Eidelberg 1974; Butters 1974; Gazzaniga 1974; Luria 1973). A larger portion of restoration of function comes from re-organization of systems than from disinhibition (Luria 1966). The statistically indistinguishable performances of the recovered organism and its normal control may actually reflect a different manner of functioning (Stein 1974).

One of the most vivid illustrations of this point was written in another context (Lashley 1935). It will be described briefly because it provides an unforgettable example of what may be hidden under quantitative and statistical equivalence. Extensively lesioned rats performed a double latch box problem in exactly the same time as the normal animals. The qualitative difference was clear. The normal animal solved the problem with great economy of effort (but no time saving) using his fore-feet first on one latch, then on the second. The lesioned animals never arrived at the most efficient method. For example, one solved the problem by climbing on the top of the

partition, falling backward, hitting the second latch with his shoulder as he fell, thus triggering the mechanism, and did this every time he was presented with the problem. The performances were statistically indistinguishable but the strategies were dramatically different.

It is neither argued nor assumed that dyslexia is the result of brain damage. It is suggested that what has been learned about brain function in general and about the brain's response to insult may be used in understanding the different brain of the dyslexic. The same principles may apply.

Applying these principles to dyslexia it is possible to suggest an answer to the question posed before in the context of the delay model: Meanwhile, what is happening in brain while this selective and ontogenetically varying retardation is going on? It is suggested that the dynamic brain is not waiting for the pieces (used here metaphorically, only) to mature. They will probably never mature as in the norm; that is, in the same way. The principle is that brain organizes itself with what it has at its disposal at a given time. (See Gazzaniga 1970 for the cross-cueing strategies that split-brain preparations and split-brained humans develop in order to achieve integration; see also Sperry 1974.) That *what* is different from the norm in the dyslexic brain and the resulting functional organization will be different from the norm. Consequently, the strategies will be different, also.

This formulation has specific research implications. Following Goldstein (1948) the questions are not only what and how much dyslexics can and cannot do, but critically how do they do what they can do (which includes superior as well as normal function) and why aren't they able to do what they cannot do? These questions must be asked first in behavioral terms and secondly in terms of mechanisms. And, they must be asked of the defining problem, reading difficulty. A careful study of the structure of a given psychological process must precede efforts to ascertain the cerebral mechanisms in question (Luria 1973). Although this approach comes from clinical neuropsychology, it is not incompatible with precision and quantification and statistical analyses (Jenkins et al. 1975). Cognitive psychology seems particularly pertinent because in a way we are asking about the cognitive strategies the dyslexic uses. Cognition means to know. From this framework, it should be instructive to ask how the dyslexic knows the world and especially, how he does or does not come to know print. There are adequate methods in cognitive psychology to put to the task (Calfee 1975; Gerstman 1976).

There are potential applications to intervention. A gain in systematic understanding of the strategies used by dyslexics and of the phenomenologi-

cal (qualitative) nature of their difficulties with reading can perhaps supply even more effective remediation procedures than are currently in existence and make available to those who want it remediation for the residual reading and spelling problems that persist through adulthood.

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The Lens of Language

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"When people thought of a language, how did they think of it if there were no words to think with? After they had thought of it, how did they get other people to understand it? If they went from door to door explaining it, people would think that they had gone crazy because they wouldn't know what the words meant. After the first language was started how were others formed? These are the questions that make me say, 'I wonder how people learned to talk' " (Ruesch and Bateson 1951).

These words by Janet Baker in a letter published in *Look* magazine (September 27, 1949) articulate with the clarity of a child the puzzle which has fascinated anthropologists, educators, philosophers, linguists, and many others for years. How did language and speech first develop? How did it happen that human beings, of all living creatures, were the ones to begin this kind of communication? What occurred that made this possible? Why did it happen? We may never be able to place together the pieces of this incredible puzzle, although the delight of hypothesizing will undoubtedly continue. Did speech develop from need, a fortuitous juxtaposition of an articulation with an object, or did a sudden change in brain structure occur which resulted in the ability to store, compare, and retrieve linguistic symbols? Or was there another reason? What is the relationship between words, whether spoken or written, thought, and the electrical charges that move mysteriously across the brain?

It has been said that man became able to speak when he developed the ability to walk upright. This shift in stance resulted in changes in oral structures and tongue placement that made it possible to blow air out of the lungs (DuBrul 1958). Langer has pointed out that only in humans are the oral structures, the capacity for prolonged phonation, and the brain structures capable of cognitive evaluations all present (Langer 1951). Yet along with these musings on the physical metamorphosis which may have made speech possible, we must consider the most basic of questions. Why develop speech at all? The answer to that, at first, appears simple. Naturally, to communi-

cate. Why else? Ah, but then we leap headlong into the whirlpool! Communicate? How do we do that? The most common path of communication for the world's human population is by way of words, spoken words, written words. But communication deals with much more than single words spoken or printed. Communication deals with language relationships and with human relationships, of which words are the tools. As Langer wrote so beautifully: "For language is much more than a set of symbols. It is essentially an organic, functioning *system*, of which the primary elements as well as the constructed products are symbols. Its forms do not stand alone, like so many monoliths, each marking its one isolated grave; but instead, they tend to integrate, to make complex patterns, and thus to point out equally complex *relationships* in the world, the realm of their meanings" (Langer 1942).

Only within recent years have we begun to understand the relationship between thought (Whorf 1956, Vygotsky 1966, Church 1961), the development of cognitive skills (Piaget 1955, Beard 1969, Bruner 1973, McNeill 1970), and some of the structures of our language. Indeed, the manner in which we categorize our world by language helps to shape our thinking patterns, even our lifestyle. "If life is a river, speech is a babbling brook whose course parallels that of the river. The brook is smaller and simpler than the river." (Brown and Lenneberg, 1966) Yet through the simple brook we may follow the flow of the river and even come to understand it.

This is an important concept for teaching all children, but especially so for those whose English-speaking is limited, the disadvantaged, and the dyslexic. Through the "babbling brook," we can guide and structure the development of cognition and, in essence, living.

In any group of people there will be found individual differences in abilities to listen with understanding, to read with comprehension, to manipulate language mentally in order to form new relationships, and to relate ideas and feelings in an organized, free-flowing manner. Reasons for this are diverse and dependent upon both genetic and environmental factors.

In these days of renewed interest in the development of children's thinking skills through activities utilizing physical involvement, it is important not to lose sight of the fact that we must consider the brain also as a physical entity. The physical structure of the brain is the basis for language, upon which our higher order cognitive processes depend. Learning and understanding depend upon electrical and neurochemical changes in the brain. There still is a great deal about this process that we do not know, although research is

providing some keys. We know that three changes take place organically when we listen. First, the signal is physical, a movement of air molecules which vibrates the ear drum and sets the tiny ossicles of the middle ear in motion. In the inner ear, this signal is translated into a stimulation of nervous tissue, an electrical charge which travels along the auditory nerve to the brain. Finally, at the points of synapse from one neuron to another, a neurochemical process occurs (Asimov 1963). Only then do we hear.

We know, of course, that a child's ability to comprehend and to use language is dependent upon intact sensory modalities: hearing, vision, touch, taste, kinesthesis. Language function, however, is also dependent upon those neural pathways in the brain which can receive information and relate it to other bits of information which have been stored and yet are available for comparison and retrieval. These nerve pathways in the brain are actual patterns, both of space and time, with many junctures (Berry 1969).

It would seem that the more junctures and connections that there are in the brain tissue associated with a single experience or concept, in other words the more multisensory the experiences, the more permanent the memory of the concept and the more easily it might be retrieved for understanding or functional use. Whether the stimulus be through the eye as in reading, through the ear as in listening, or through those mysterious inner processes which we have labeled "thought," the potential for breakdown or a disability in formulating the connections is more possible than has been realized.

Nor has it been generally understood how little we have really known about the process of listening, or reading, and understanding the message. Studies by psycholinguists on the relationship between speech and reading, writing and listening are beginning to open to us some of the complexities of our language and the simplistic view which we have had in the past. Reading is not just of speech written down! Speech is not just an acoustic cipher, with the sounds in the word /bat/ the same as in the three sounds /b/ /a/ /t/, only spoken more quickly so they are blended. Spectrographs of a spoken word show that sounds overlap and influence one another. For example, on a spectrograph, the /a/ sound will not look the same if preceded or followed by different consonants, and the /b/ in /bag/ is not acoustically the same as the /b/ alone or the /b/ in /cab/.

On a cognitive level, perception and understanding occur in the same way, with an overlapping within the message. This sentence is an example:

The man who sings married the pretty girl.

The sentence is composed of three kernel sentences, which are:

1. The man sings.
2. The man married the girl.
3. The girl is pretty.

By themselves, sentence #1, *The man sings*, and sentence #3, *The girl is pretty*, are not related. The second sentence, *The man married the girl*, overlaps both of the other sentences, molding them into one linguistic unit, a unit of complex relationships (Liberman 1970).

This telescoping of thought allows a gain in speed of communication as well as pointing up relationships that would be difficult to clarify if only kernel sentences were used. Yet this telescoping may be an area of difficulty for the dyslexic child and pose for him a major stumbling block to communication. Outward symptoms of this problem may be noted when a child has difficulty following oral directions or listening to stories with good comprehension. The disability may occur in an even more severe form in a lack of reading comprehension.

It is important for us to realize that language passes through several translations, or encodings, before it reaches the level of motor speech. The process begins with the thought in its *prelinguistic form*, about which we really know very little. Within the brain, the thought is formed. This is the deep structure, or *semantics*. The thought is encoded into *syntax*, or surface structure, the grammar of the language. This surface structure is translated into *phonology*, or the phonetic structure contained in the words and phrases. This, in turn, is translated into the *acoustic* structure, or speech, which is not the same as the phonetic structure of the words. Each individual must make several translations cortically before speech can occur (Cooper 1972). Vygotsky stated metaphorically that "a thought can be compared to a cloud which sheds a shower of words" (Vygotsky 1966). Indeed, as the atmosphere must pass through several metamorphoses before a rain occurs, so within the brain concept must change before speech results.

This same process must happen in reverse, at least to the level of thought or comprehension, when a person is listening to the speech of someone else. In reading, the visual symbols must be translated into the phonetic structures and from there probably into the acoustic structures before traveling into the deep structures where the reader finally reaches the level of comprehension of the message.

We pass through this process so quickly and with such seeming ease that I suspect we have not been aware of breakdowns which can occur. We have been too quick to say, "If you knew the answer you would be able to explain it," when a child states that he knows the answer to a question but just can't say it. We have been too quick to say, "If you would just listen, you would know what to do," when a child is confused about a lesson assignment. We have been too quick to say, "She's a nice child but not very smart," about a seemingly placid, taciturn child who works hard in school, reads poorly, spells worse, and never has anything to say.

Reading, which is another code heaped on top of the speech code, complicates the situation enormously for children with this disability. Many, even when they have learned to decode words, have not yet learned to translate these words into the deep structures which contain comprehension of the thought. The relationship between the needs of these children and teaching techniques based upon Piaget and Bruner, among others, is clear. They need structure, they need to learn how to inquire, to inspect, to relate, and to draw conclusions. And they need help in formulating all of these processes in language.

Common Characteristics of Language-Disabled Persons

Some of the symptoms by which language disabled persons reveal themselves are:

1. Often they are silent persons, content to listen and let others do most of the talking.
2. They may have word-finding difficulties, groping in an attempt to retrieve a word that hangs just out of conscious reach.
3. They may mispronounce words, getting the sounds confused and out of order. This symptom was noted early by Dr. Orton in his studies of children with specific language disability (Orton 1937).
4. Their speech may be indistinct, with words jumbled together.
5. They may miscall words, giving a sound-alike word or neologism.
6. They frequently have a short auditory memory span, for both short-term and long-term memory. Often, they experience difficulty mastering certain sequenced learning tasks, such as the multiplication tables or telling time.
7. They may have great difficulty handling concepts of time, both

specifics such as hours and days, and more general time words, such as before, later, after awhile.

8. Commonly, they do not follow oral directions well, forgetting, confusing the sequence, or misunderstanding the directions.

9. Often these persons cannot retell stories which have been read to them. They do not see the point of jokes which contain puns, and if they attempt to tell a joke often mangle the point.

10. Reading comprehension may be very poor, even after decoding skills have been learned.

Examples

Harry

At the age of eight, Harry exhibited many of the symptoms of a language disability. He spoke in a soft voice, often substituting a gesture for an answer, instead of a verbal reply. His vocabulary and grammatical structure were below expectancy for his age. Although his intelligence rating on the WISC fell within the low average range, and he was repeating first grade, Harry was still a non-reader. He had an articulatory speech disorder.

This was Harry's story of *Goldilocks and the Three Bears,* accompanied by flannelboard pictures which were placed on the flannelboard to aid him in the story sequence.

"One upon a time there were three beard."

Pause. I prompted, "Who were they?"

"Beard." (Bārd)

"But who?

Harry shrugged. I pointed to the figures.

Harry said, "Fadah beah, Mama beah, Baby beah."

Silence. I prompted, "One morning . . . " Harry repeated this with a facial grimace, then shrugged. "She cooked the porridge." Harry repeated it. "Did they eat it right away?"

"No."

"Why not?" Grimaces, shrugs. I said, "It was too hot." Harry repeated it. Silence. "What did they do?"

"Went out to the woods." Pause.

"Then what happened?"

"Goldlilocks."

"What happened?"

"Went in the house, eat the porridge."

I pointed to the chair on the flannelboard. "First she said . . . "

"On Papa's. It was too high. Mama's chair. It was too low. Baby's chair . . . too little."

"I thought it was just right."

"Just right."

"Then what?"

"She ate the porridge, broke the chair."

I placed the beds on the flannel board and put Goldilocks on Papa Bear's bed. "Then what happened?"

"So—it was too high. Mama bed was too low. Baby's bed was just right. They came home. Somebody's been sittin' chair. Somebody been sitting in my chair. Somebody been sittin' in my chair and it all broken. They went upstairs."

"Somebody been 'leepin' in my bed. Somebody been 'leepin' in my bed. Somebody been 'leepin' in my bed. And there she is."

Silence. "Then what happened?"

"She ran."

That was the end of Harry's story. Examination points up several of the linguistic weaknesses of this child, in addition to articulatory speech difficulties. He had a great deal of trouble with word finding, and responded to this frustration with shrugs and facial grimaces. Syntax and morphology were both faulty, with incorrect verb forms, *s* omitted in plurals, sentence fragments and scanty sentences. He was not able to weave his sentences into a coherent story. Not only were his sentences fragmented, but his story suffered from the same deficiency.

With such poor command of language, Harry found it difficult to make friends. He was very much alone. School work was impossibly difficult for him. He had many characteristics of the retarded child, which he was not. Harry had a severe language disability, affecting all aspects of his intellectual and cognitive growth.

Bobbie

Bobbie was a charming boy in second grade. He talked a great deal, enjoying greatly the sharing periods in the classroom. Unfortuantely, there was so much confusion in his thinking that the teacher and children often could not follow the thread of his story. Compounding the problem was a general indistinctness in his speech, with words run together or with entire

syllables juxtaposed or omitted. His syntax was marked by omissions. Here is a part of his story of *The Three Bears*.

"He went up the ladder [stairs] 'cause he was so sleepy." [Note the pronoun usage.] "Then Goolash [Goldilocks] lyed down on Papa's bed, and it was too hard. Then Goldilocks wayed down on Mother Bear, but it was too sof'. Then Goldilocks way down in Baby's Bear, and that's the right I want. So she went to sleep. Papa Bear said, 'Who left the door open? It was you, Baby Bear?' 'No.' "

A pause. I prompted, "They came in. Papa Bear looked at his bowl."

"And Papa Bear said, 'Who ate my bowl?' I mean . . . what's that they call it?"

"Call it cereal."

" 'Who ate my cereal?' said Mother Bear. And then Baby Bear looked at his bowl, and then he said, 'Who ate my bowl?' Then they look at their chair, and Papa Bear said, 'Who sit on my chair?' Then Mother Bear look at his chair. Then Mother Bear said, 'Who sit in my chair?' Then Baby Bear said, 'Who broke my chair up?' Then they went up the stairs. Then Papa Bear said, 'Who wayed down on my bed?' Then Mother Bear said, 'Who wayed down in my bed?' Then Baby Bear said, 'Somebody is in my bed.' Then Papa Bear and Mother Bear looked in and Goldilock open its eyes. Then he ran down the stairs and came back to the woods.' "

The confusion in tenses, pronouns, and other syntactic structures is clear. Bobbie was an intelligent boy, creative and with good ideas, but his language disability was crippling him. Once when we were discussing time, I asked him what he thought a second was. This was his reply: "A second! Oh dear. A second! The second hand is the hour hand. I'm not too sure if I don't know."

Sometimes the word retrieval problems and difficulties with syntax and semantics are more subtle and hard to find. Adults may conclude that the child's lack of verbal ability is associated with limited intelligence. Such may not necessarily be the case. As parents and teachers become familiar with the typical characteristics of a language disability, they will begin to be more aware of those discrepancies in the child's speech which are out of line with incidents showing alertness and comprehension.

Intervention

Once the difficulty has been identified, there remains the problem of intervention. What should the teacher or the parent be expected to do to help

a disabled child learn this verbal system, these interweaving patterns of relationships that we call language? It is important to recognize the scope of this disability, to understand that we are involved with more than teaching articulatory or decoding skills. These capabilities are important but are not the only need of the child with a language disability.

The severity of the disability for some children is so great that professional help should be sought. Ideally, the speech pathologist, doctor, teacher, and parents will work together to plan assistance for the child. For most children, however, there is much that can be done as a routine part of regular classroom activities. It is of prime importance that at all times the child know that he is accepted and that his feelings and the ideas that he wishes to communicate are of value, no matter what his lack of skills may be.

Following are a few suggestions for activities to improve verbal skills in the areas of enunciation, vocabulary, and language structure. These are not the only areas into which verbal ability may be divided, of course. The activities themselves were chosen with the hope that persons would be stimulated to develop their own ideas from experimenting with the ones which are given.

Enunciation

The ability to pronounce words clearly and with precision is one of the fundamental requirements for oral communication. Frequently, children with poor enunciation are not aware that they jumble their words together. Use of a tape recorder is valuable so they may hear their speech without dividing their attention by having to talk at the same time. The child may work by himself, using headphones, or the activity may be carried out in a small group. As with other teaching aids, training in the use of the tape recorder and in the structure of following through on the task is indispensable. The child must learn how to listen to himself and how to be alert for specific objectives for the activity.

Many times, children with auditory-perceptual disabilities cannot process auditory units as fast as other children. There are several ways by which we can alert children to auditory sequences. For example, the teacher may pronounce a word slowly and ask the child to repeat the word at that same tempo. She may divide the word into syllables, with a slight pause between each two syllables, such as 'bas - ket." The child will repeat in the same manner, then gradually pick up speed until normal speech is reached. Much

repetition is needed before any measurable improvement occurs in auditory processing speed.

This activity can be expanded to include phrases and sentences, with some variations on the task. For example, the child may listen to a sentence spoken at normal speed. He then repeats the sentence at a slower speed. Words that he has not learned to say clearly, or did not hear clearly, will be revealed in syllable inversions, elisions, and phoneme transpositions. These words can be picked out for extra practice by syllables.

As another variation, a polysyllabic word, such as *mentbalatum*, may be named. The child will repeat this "tongue-twister," clapping on each syllable. The teacher may clap also, clapping louder on the accented syllable.

The teacher may form a small group of children who need work on rhythm and stress. As a group they practice clapping with words, phrases, and sentences. This activity will help them realize that all speech contains points of accent which are delineated by varying loudness, pitch, and inflection, or by hesitations. It is important to make clear to the child that these supra-segmentals, or nonphonemic language features, help to clarify the thought behind the words.

Vocabulary

In addition to having difficulty with word retrieval (anomia), the child may also be handicapped by a sparse vocabulary. It is important that several avenues of remediation be used. First, the teacher should call upon all the senses when teaching a new concept. No matter how unusual the association, whether taste, touch, or smell, as well as the usual sight and hearing, the child should be encouraged to draw on these senses. The kinesthetic-motor and proprioceptive senses are avenues of learning which are often neglected (Furth and Wachs 1974). Recall of words may be triggered through many senses.

In addition, vocabulary expansion should be a part of each school day's lesson plans. There should be form and purpose to the vocabulary selected.

It is important, especially in the kindergarten and primary years, that work be planned to develop and widen children's experience with and comprehension of categories. Activities in this area should include practice in telling how items differ as well as ways in which they are alike; e.g. a horse and a dog are alike because they are alive, they are animals, and they have four legs. They are different because a horse eats grain and a dog eats meat, a horse is bigger than a dog, and we can ride a horse but not a dog.

The teacher may build a file of pictures around specific vocabulary objectives, such as building children's knowledge of words related to time, distance, prepositions, different ways of stating the same concept, and interpretation of meanings (Slingerland 1967). Questions can often be stated so that they are open-ended and divergent in nature, encouraging the development of the cognitive skills of observation, interpretation, inference, hypothesizing, and predicting.

For children with language disabilities, it is important to teach different meanings for the same word, since this may be an area in which the children are severely restricted. As an example, the verb, *run*, has several meanings. "The boy runs." "Main Street runs by our house." "I have a run in my stocking." Teachers and parents should be alert for the children who do not get the point of jokes which depend upon puns for humor, at an age when many children enjoy punning. These may well be children who need special language activities.

Practice in explaining the rules for a game or in describing objects can be a fairly complex activity. Words that are needed for specific detail should be supplied if the child cannot recall them. For example, if the child should say, "It has a thing at the top," the teacher might respond, "That is called a clasp. Tell me—'The purse has a clasp at the top.' " The child will then repeat the sentence.

Language Structure

There is much that we do not yet know about the relationship between morphology, syntax, semantics, and cognitive development. Being able to repeat or echo a statement following a teacher does not necessarily mean that the child has made the necessary associations from the acoustic down to the deep structures where lies the thought that is embedded in the words. Nevertheless, there are some activities with which we can help develop this area.

Giving a pattern as an example by which the children will generate sentences of their own offers more promise than rote repetition. Drill could begin with the teacher providing a sample for the children. She might say, "I have a ring. What do you have?" The child called on would reply, "I have a dress." Then the child would turn to a neighbor and ask, "What do you have?" (Kost, undated). This activity can be expanded to include more complex sentence structures, such as transformations of kernel sentences. For example, the negative could be structured like this: "I don't have a ring. What

don't you have?" The passive transformation might be stated as, "At the airport, I was met by a friend. Who met you?"

Special attention should be paid to words which are linked to time. For example, the teacher might ask the child to pick out the word in a sentence she says that tells *when*. "*After* the game was over, we went home." "Joe could not play *until* he had wiped the dishes." Explicit time words, such as hour, week, or month, are easier for children to recognize as related to time. The child with a language disability, however, may have no real understanding of the relationships of these words to actual time blocks.

Practice with sentence expansion helps the language-disabled child gain an understanding of the function of parts of a sentence. The teacher may begin by asking the child to repeat a kernel sentence. The child repeats this sentence. The teacher then leads into sentence expansion by posing questions, which the child answers by repeating the kernel sentence and expanding it to answer the teacher's question.

Teacher: The child hit the ball.

Child: The child hit the ball.

Teacher: What kind of ball did he hit?

Child: The child hit the tennis ball.

Teacher: What color was the ball?

Child: The child hit the white tennis ball.

Teacher: How big was the child?

Child: The little child hit the white tennis ball.

Drills of this type, with the teacher giving assistance in the sentence expansion where needed, can do much to develop children's understanding of the relationships involved between the words themselves, as well as in sentence order. This knowledge is basic to facile, clear comprehension in reading as well as in listening.

Practice in oral closure is also a valuable aid in linguistic development. Difficulty in anticipating where the thought is going is a stumbling block to comprehension of language, whether oral or written. The teacher may read a sentence, but stop before it is completed. The child then completes the sentence with a word or phrase that makes sense. For example, the teacher might say, "Before I eat breakfast, I . . . " The child could respond, "brush my teeth." Any linguistically correct response that is probable should be accepted. This same type of exercise should also be carried out on the level of a story. Accompanying this deficit may be a basic need for training in how to listen, how to pick out key words, how to relate one facet of the story with another.

From the beginning of their school careers, children should be given opportunities to verbalize paragraphs. In the classroom, this can be done as a group activity, using various ways of starting. The teacher might ask the children to select or suggest a topic of interest, or she might begin by posing an incomplete sentence as a topic sentence. A child would repeat her phrase and complete the topic sentence as he wishes. Extending the thought further, the teacher would elicit from the children two or three sentences that would expand the topic sentence, then call for a sentence to make a good ending. When this has been done, various children have an opportunity to repeat the entire paragraph, to see if they can remember to put in everything that has been said. This retelling must be phrased in complete sentences. Practice like this forms a solid base for language development and for development of comprehension of paragraph structure. It leads to increased skills in speech, in listening and reading comprehension, in both creative and propositional writing (Slingerland, in press).

Within and throughout the work that we do with children with specific language disability, there must remain paramount in our attention the knowledge that language is the lens that focuses upon our humanness, our development as persons, and our abilities to think and to communicate with each other. As Church pointed out, "The value of an education lies only partly in the things we come to know—after all, we forget the greater portion of what we learn—and even more in the kinds of persons it makes us by virtue of our having learned what we have learned, including what we have forgotten" (Church 1961).

The ultimate value in a decoding skill is not in unlocking the word, but in the starflash that results when mind meets mind, when the reader exults, "Oh yes, I know what you *mean*!"

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Small Group Instruction for Language Skills Improvement

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Much has been written about individual tutoring in oral and silent reading, and in writing, for high-potential students with specific language disability. Less has been said or recorded about small group teaching for English-disabled children of all ages, especially middle school students who may be in grades six through nine. Since I have done diagnostic teaching with middle school groups for the past seven years in both public and private schools, it seems reasonable for me to write about the academic and personal gains students make and to share techniques that work.

The diagnostic teaching referred to in this article is based on the English language continuum developed in both the green and red versions of the Gillingham-Stillman Manual: *Remedial Techniques for Children with Specific Disability in Reading, Spelling, and Penmanship.*

A teacher needs an intimate knowledge of the sound/symbol relationships of English words, and a facility with the structure of phrases, sentences, and paragraphs. He or she also needs skills in the dynamics of human relations in order to guide groups so that students learn to interact by taking from and giving to their peers.

In the fall of 1969 I began teaching several public middle school students. Five were 6th graders, two 7th graders, and one 8th grader. Two had been tutored before and had been diagnosed as dyslexic. One 6th grader had serious language problems but had not received extra help the year before because he had made it so difficult for a tutor. Five had no previous tutoring but were working at least two grades below level in reading and spelling. All had above-average to high potential. Work with these students was all on an individual basis, forty minutes per day, three days per week.

Information sheets on all students were made out so that I would have ready access to age, handedness, parents' names and home address, phone, brothers and/or sisters, interests, and notes on previous tutoring or testing.

Such information was continually up-dated with comments from teachers, parent conference notations, results of school testing during the year, plus scores of tests administered by me as records of progress.

The first diagnostic teaching results were recorded in each folder with a list of *knows* and *needs* according to the Gillingham language continuum. The first 20 minutes of each 40 minute lesson were devoted to word attack skills and developmental reading for improved comprehension and vocabulary. Twenty minutes were devoted to word analysis for spelling, writing sequences of sound in dictated sentences, proofreading, learning to build ideas into correctly structured phrases, sentences, and paragraphs. Constant review was included to be sure that learning was taking place.

Lesson plans were worked out in a teacher's book and student's work-sheets were kept for reference in report writing and for visual reinforcement of gains. Reports with copies for parents, the Special Education Department, and the Middle School Guidance Department were made out in December, March, and June of each school year. In these reports, a written record of work done in oral and silent reading with comprehension, plus spelling and writing, was implemented by comparative scores from fall to spring in the Morrison McCall Spelling tests, Gray Oral Diagnostic Reading tests, and McCall Crabb Silent Reading and Comprehension timed tests. A list of materials used was also included.

The students made substantial gains during the first year. The program continued for a second year with several new students. One of the 8th graders went on to high school where she continued with a tutor. Several years later she sent us an invitation to a very special occasion for her. She had been admitted to a national honor society and had been given high recognition for her editing of the high school paper. She said it was because of the help we gave her in English; but we know that it was largely because she was highly motivated and worked hard.

In a report that another middle school language specialist and I prepared in December 1971, we said, in part:

> . . . middle school students, with average and above intelligence, but testing from two to four years below grade level in spelling and reading, work with two language tutors for a variety of reasons. Some students missed language basics at one grade level or another because of changes in school systems; others did not pick up, master or retain the basics at the time they were taught because of emotional blocks; still others, because

of varying perceptual patterns, need and learn better with special reinforcement of the auditory, visual, and kinesthetic areas involved in listening, speaking, reading, writing, and spelling. Progressive phonic language training is given each student, individually and in small groups.

Goals of the Language Learning Program at the Middle School include the following areas for both tutor and student:

1. to help students overcome particular deficiencies or lack of skills which have impeded academic progress to date;
2. to encourage and enable students to assume increasing responsibility for their own learning;
3. to insure success for the students so that developing skills may be applied in other academic areas. By maintaining an awareness of classroom expectations, tutors may help teachers modify where necessary assignments to correspond with students' present capabilities.

Growth of the program is indicated by a doubling of the number of students from about 20 in 1969–70, with two tutors teaching three days per week, to the present number of 42 students instructed by two tutors five days per week. Depending upon need, individual and group work is arranged for students in addition to their regular classes. Time ranges from a minimum of two to nine 20-minute modules.

Some students progress to above grade level in one, two, or three years and drop out of the program. Some go above grade level in one area of reading or spelling and not the other; many who are the farthest behind never quite catch up and need continuing help on into high school.

During these three years, students were coming in from their regular English classes asking, "How do you conjugate a verb?" By talking with the English teachers, and sitting in on their regular meetings, I began to put together ways in which the structured Gillingham sequence could reinforce regular grammar. I found my students in seventh grade English classes trying to analyze sentences for word use where the words were difficult for reading, writing, and spelling. So I started with basic sentences in the short vowel area and developed the parts of speech and word use on through the rest of the language continuum. "What is a pronoun?" "What does a verb look like?" Such questions and their answers became part of our regular tutoring sessions, with grammar becoming a functional part of learning to read, to comprehend, and to write English.

In June 1972, the following Progress Report was written on one of the

7th grade boys (only the parts significant for this article are included):

CUMULATIVE REPORT FROM SEPT. 1971–JUNE 1972

Language Training time: weekly
60 min.–group of four 6th graders
40 min.–group of four: 2 6th graders, 2 8th graders
20 min.–alone

Comparative Test Results	Morrison McCall Dictated Spelling	Gray Oral Reading	Morrison McCall Silent Reading/Comprehension
	9/71 4.7	(B) 10/4/71 4.5	Timed/3 min. 11/23/71 2.9
	5/31/72 4.7	(A) 3/23/72 5.2	5/17/72 4.1
	No gain on ntl. norm. Gain in basic spelling.	(B) 6/8/72 6.6 Gain 2.1	1.2 Gain

SPELLING. Ricky has had a thorough review of basic spelling including the following areas, plus some more advanced work in word analysis:

Vowels: short, v-con-e, long, digraphs and diphthongs, with r, and sound changes to schwa.

Consonants: single/multiple sounds; blends, digraphs, trigraphs, silent, special combinations in non-phonetic words

Generalizations: -ch, -tch; -k, -ck; -ge, -dge; hard and soft c/g spellings

Syllables: closed, v-con-e, open, -con.le, -vowel r, diphthong

Rules: Doubling, E and Y

Affix work: -s, -es noun plurals and verb forms; -ing, -ed, -er, est, -ful, -ment, -less, -ness, -age, -y, -ly, dis-, mis-, un-m em-, im-, en-, a-, ab-, de-, per-, pro-, re-

Grammar: Nouns, verbs, adjectives, adverbs, pronouns, prepositional phrases. Tenses of verbs. Punctuation.

Ricky still needs much practice in the spelling of hard words. Twenty minutes of each 40 minute session was spent in writing words, phrases, sentences, and some paragraph work. He learned to reread his written work and correct the misspellings by sight and by sound.

READING. Good progress has been made in oral reading as shown in the gain of 2.1 years in one year. Ricky's word attack skills have greatly improved, as well as his comprehension. However, on the silent reading

with comprehension, his score is still much too low. Additional vocabulary help with skills in selecting details are needed. Ricky has been cooperative and worked well.

A list of instructional materials completed the progress report.

Details of work with Ricky were presented in November, 1974, at the World Congress on Dyslexia sponsored by The Orton Society in cooperation with the Mayo Clinic. A resume follows.

The case study concerns a 4th grade public school boy, age 9.3, operating from 1–2 years below grade level and identified in mid-February, 1970, as needing language help for deficits in auditory discrimination of sound/symbol relationships, for visual difficulties in sequencing letters when reading and spelling, and for deficiencies in oral and written expression. A resume of his problems and successes in 4th and 5th grades brings the study up to September of 1971 when 6th grade reading and spelling tests confirm that he still operates 1–2 years below grade level.

The case study gives specifics of the structured language development training, the amounts of time in ability groupings and alone, and a detailed explanation with work samples of the methods and materials used. Sixth grade gains are shown in the Progress Report.

Peers who stayed on to receive help during the 7th grade in a Learning Center situation continued to make substantial reading and spelling gains. The boy in this study left to enter another school at the end of 6th grade still needing help in most subjects. He had the potential for better academic work. This had been shown as early as 4th grade when good progress was made with extra reinforcement. It appears that with continuous diagnostic teaching reinforcement during 4th, 5th, and 6th grades, he could have been at or above grade level by the end of his sixth school year. The reasons he was not will be part of the case study consideration.

The next year in 1972–73, my small group English language teaching became part of a Learning Center activity where a Learning Disability Specialist and I worked with 44 students, grades 6–8. I did most of the language work with the help of part-time trainees. A Masters Degree candidate from a nearby Boston college also helped us for half a year. It was harder to help new students make individual gains under these circumstances, as groups instead of including four or five students, now consisted of five to seven because of the difficulty of scheduling. However, the following com-

Table 1. Gray Oral Diagnostic Reading Tests

	Sixth Grade				Seventh Grade	
Student	*Form B 10/71*	*Form A 3/72*	*Form A/B 6/9/72*	*1-year gain*	*Form B 5/73*	*2-year gain*
Don	1.6	2.1	3.2	1.6	2.5	.9*
Phil	3.2	3.4	4.5	1.3	6.2	3.0
Alan	3.8	3.9	4.5	.7	7.2	3.4
Paul	1.9	2.6	2.9	1.0	4.4	2.5
Dom	1.9	3.4	3.8	1.9	4.6	2.7
Ricky	4.5	5.2	6.6	2.1		
Tim	4.9	6.5	6.6	1.7	9.0	4.1
Steve	2.2	5.2	4.3	2.1	5.2	3.0
Tyler	5.3	6.2	7.6	2.3	9.3	4.0

*severe reading problems and other variables

Table 2. Morrison McCall Dictated Spelling Tests

	Sixth Grade			Seventh Grade	
Student	*9/71*	*5/31/72*	*1-year gain*	*6/73*	*2-year gain*
Don	3.5	4.2	.7	6.4	2.9
Phil	3.5	4.3	.8	4.5	1.0
Alan	4.0	5.2	1.2	4.7	.7
Paul	4.0	3.7	−.3	5.4	1.4
Dom	4.1	5.2	1.1	6.8	2.7
Ricky	4.7	4.7	−		
Tim	4.9	5.1	.2	6.4	1.5
Steve	2.2	4.1	1.9	5.3	3.3
Tyler	4.0	4.3	.3	6.0	2.0

parative sixth and seventh grade scores show the continued progress of Ricky's peers (Tables 1 and 2).

As can be seen from the two year gain column, it is often more difficult to improve in spelling than in reading.

In the Learning Center situation we had to do more group testing because of the number of students. The table below shows scores of Ricky's peers on a silent reading test (Table 3).

Table 3. Scores of Ricky's Peers on Stanford Diagnostic Reading Test

Student, 7th grade	*9/12/72*	*Spring 1973*	*1 year gain*
Don	5.3	7.5	2.2
Phil	5.8	6.0	.2*
Alan	8.5	11.1	2.6
Paul	5.3	7.2	1.9
Dom	5.0	5.3	.3
Tim	5.7	9.0	3.3
Steve	6.2	9.0	2.8
Tyler	4.2	7.5	3.3

*Did not follow directions carefully. Unfortunate because of a high potential.

In the fall of 1973, I moved to a private school to work with two other language therapists and to head the Special Education department. We provided one-to-one or small group training for 7th through 10th graders. The help included oral and silent reading with comprehension, vocabulary development, outlining, study skills, sentence and paragraph writing, grammar, and spelling. Such assistance had been offered in this school since the 1950's through Reading Labs, Study Skills Classes, Writing and Spelling Classes, Special English 7, small group work and individual tutoring.

In going over each student's work, I was interested to see what was accomplished at different levels of teaching, and to assess where one should either keep or change the curriculum.

In English 7, with special emphasis on development of skills plus literature, individuals in the group of seven made oral reading gains which ranged

from five months to a four-year growth rate by one boy. Silent reading and comprehension scores improved and the upward trend of their work continued throughout the year.

The four 7th graders with whom I worked either alone or in groups of two and three made excellent gains in spelling, oral reading, and silent reading with comprehension, yet they were still below grade level on part of this work. The five eighth graders became a good working group. The writing and spelling of all improved and they knew much more grammar than before. But the data also showed that on timed silent reading with comprehension, one was at grade level, one was a year behind, and three were two years behind. They came to me mainly for writing and spelling. But reading and vocabulary help were still needed. We began to look more closely at the school's fall test scores, and at the incoming students' test scores, to pick up any reading lags for special help.

Two 8th graders had good oral reading skills. They worked on word meanings and learned how to bring ideas together into a comprehensive whole. Two others with the greatest needs in all areas covered much material. Gains were made partly because both were really motivated and partly because of the integrated structured approach. With the tenth graders, it was a challenge to make the material as interesting as possible for those who had had help for so long. That year some of the 9th graders were having an especially hard time in a difficult biology text, and organizing for them was a laborious process. How to offer more help prior to 9th grade?

In the spring of 1974 an innovation was suggested. For several years, English 7 for a small group had been more of a basic skills course than regular English 7. The boys would have preferred to be in regular English classes with their peers. Also, with their good intelligence and listening potential, they could have been absorbing content by ear even though their reading or writing skills, or both, were weak. Why not try Supplementary 7th and 8th grade English courses for credit at the middle school? The catalogue was modified to carry a new course description for Supplementary English 7 and 8.

Four classes were scheduled for four times per week. A curriculum was designed by me and followed at each grade level, including oral reading skills, silent reading and comprehension, vocabulary and concept development, sentence and paragraph writing, outlining, word use, and structured spelling. Twelve 8th grade and eight 7th grade students were involved. In addition, an advanced spelling class included three 8th graders and one 7th grader. In the middle of the year, two 8th grade girls started working on reading with

comprehension; one 8th grade boy worked alone on reading with comprehension. While this was going on at the middle school, the two tutors at the upper school worked with a similar number of students as the year before.

Substantial academic gains were made by all 27 middle school students in the skills program that year. English and history teachers commented that the skills improvement carried over into regular classes. Students also gained confidence from the reinforcement that is possible with small group teaching. "I feel comfortable in this class," one girl said as she was getting used to oral participation.

Because of the students' academic and personal gains, the Supplementary English middle school program was continued. In the spring of 1975, classes were set up as in the previous spring. Who are the middle school boys and girls from private and public schools who were enrolled in Supplementary English in addition their regular 7th or 8th grade English courses?

All have good potential. Some are enrolled by parents who read the catalogue offering and, in consultation with school administrators, agree that their children need reinforcement in English skills before going on into a foreign language. Some, with strong personal recommendations from both private and public schools, and with what seem to be reasonable grades, show test scores which raise questions about reading ability in certain areas although they have been diagnosed as having perceptual difficulties. A foreign student may be added who needs to listen and to learn English. Still others may be added during the year because academic performance is not holding up to expectations and teacher evaluations uncover skills weaknesses.

Middle school administrators, advisors, and teachers discuss problems and progress in all academic areas. Mutual concerns are also aired in faculty meetings and during parent conferences. Materials are shared. Learning processes are discussed, and if not already understood by classroom teachers, the integrated auditory, visual, and kinesthetic approach which therapists use is explained.

One problem we faced was how to group the twenty-five 7th and 8th graders into the classes of five, six, or seven who work together four times per week, with 30 minutes of homework each session, plus regular tests, term examinations, and exam and term grades? When possible in relation to computer programming, we put together those with the best reading skills who badly need writing help. In these groups, we concentrate on writing and use the good reading for visual reinforcement. For those with good writing skills, we use auditory proofreading and kinesthetic speaking and writing to

aid in the sound analysis of words, sentences, and paragraphs. When no such specific differences show in relation to reading and writing, we use the integrated auditory, vusual, and kinesthetic approach of structured language development with regular 7th and 8th grade materials.

Here are the variables with which we work in order to help students understand the structure of the English language:

Short vowel sounds in closed syllables
Long vowel sounds in vowel-consonant-e syllables
Open syllables with long or other vowel sounds
Closed syllables with varied vowel sounds
Closed and open syllables with vowel digraphs, diphthongs, vowels with r, w, and gh
Same sounds for different consonant spellings
Same sounds for different vowel spellings
Same spelling for different sounds
Schwa for all vowels

All students will not need exactly the same sound or grammar sequence. Ways to find out what students know or need, or where they are on the Gillingham language continuum, plus constant review and assessment of progress, are available through sources listed in the accompanying table.

Supplementary English 7 and 8

Areas included:	Oral Reading
	Silent Reading/Comprehension
	Vocabulary Development
	Outlining
	Grammar
	Sentence and Paragraph Writing
	Language Structure/Spelling

Materials—Seventh Grade

Warriner's *English Workbook*	Harcourt, Brace & Jovanovich
Design for Good Reading	
Learning the English Language: Skill Book I	Educators Publishing Service, (Cambridge, Mass.)

Thirty Lessons in Outlining (E1)	Curriculum Associates, (Newton, Mass.)
McCall Crabbs Test Lessons in Silent Reading/Comprehension	Teachers College Press
National Geographic School Bulletin	National Geographic Society
Current Events Articles, Poems, Plays	

Materials—Eighth Grade

Reading/Writing Workshop	Harcourt, Brace & World
Words, Phrases, Clauses	Independent School Press (Wellesley, Mass.)
Wordly Wise 4	Educators Publishing Service (Cambridge, Mass.)
Thirty Lessions in outlining (Adv.)	Curriculum Associates (Newton Mass.)
McCall Crabbs Test Lessons in Silent Reading Comprehension	Teachers College Press Teachers College Press
Learning the English Language: Skill Book II	Educators Publishing Service (Cambridge, Mass.)
New York Times School Weekly	New York Times
Current Events Articles, Plays, Poems	

Materials—Seventh and Eighth Grades

Phonics Proficiency Scales (Reading)	Educators Publishing Service (Cambridge, Mass.)
The Childs Spelling System: The Rules	Educators Publishing Service (Cambridge, Mass.)
Gillingham Manual	Educators Publishing Service (Cambridge, Mass.)

Our reading goal is to able to read accurately, fluently with expression, and with good comprehension.

Individual oral reading or as a group process helps a teacher to find out what is going on when students are reading, and to determine what sound units of the language need to be taught. When reading aloud, students can

hear their mistakes, or mistakes will be picked up and corrected by peers. This can be a positive experience if properly handled. Peers can share their expertise with a colleague whose skills are not as good. It was said to me once by a sixth grader: "I haven't heard myself read since I was in the third grade." Students often do not know what errors they are repeatedly making, nor how the omission of little words or the mispronunciation of vowel and consonant sounds can distort meaning. Together, in a group process, we practice oral reading. Seventh graders are encouraged to read some of their homework aloud when studying at home. If a student shows great difficulty, I administer a Gray Oral Diagnostic Reading Test to get a grade level and to determine the specific reading problems of that particular student.

Let us look at a paragraph, "Nature Still Does It Better," from *Design for Good Reading* which is hard reading for some 7th graders. These essays are short and have words which provide opportunitites to apply the word attack skills which are being learned. Also, new vocabulary words can be underlined, discussed in class, and looked up in dictionaries. The following paragraph is from an essay with science content. There are other essays in various fields. A goal for a language therapist is to encourage teachers in all academic areas to use some of the following skills to help students with reading and comprehension.

Nature Still Does It Better*

> Insects are especially expert at sounds and odors. The reaction of houseflies to sounds is a weird case in point. The noise of an exploding firecracker will not faze the fly, but he is repelled by the almost inaudible sound of a rubber stopper turning in a bottle. Certain moths drop to the ground when they hear the ultrasonic cry of a bat, a natural predator. Insects' reactions to odors are incredibly delicate and discriminating.

Word Attack

especially	/is-ˈpesb-(ə)-le/	-ly adj./adv. suff.
weird	/ˈwi(ə)rd/ adj.	exception ei-ie rule

*From *Design for Good Reading* (Harcourt, Brace, & World, 1962).

incredibly	/in-'kred•ble/	in- pref. not, in -ible adj. suff. -y suff. E Rule
delic*ate*	/'del-i-k•t/ adj.	exception to v-con-e long v.
discriminating	/dis-'krim-ə-nat-iŋ/ Schwa for reading/ spelling	dis- prefix out of -ate suff. -ing suff. E Rule. Use as participle
Vocabulary		
ultrasonic	ultra- prefix	1. beyond in space, beyond the range of, beyond what is ordinary, beyond what can be heard by the human ear
predator	one that preys, destroys	
faze	to disturb the composure of	
Rules		
stopper	Rule 2 double or not	
flies	Y Rule	
repelled	Rule 3 in second lll accented syllable, double final consonant before a vowel suff.	
incredibly	E Rule	
discriminating	E Rule	

In order to find out how students are progressing with regular 7th or 8th grade reading, we regularly use selection froms the McCall Crabbs' "Test Lessons in Silent Reading with Comprehension." Each book in this series contains 78 three-minute reading exercises comprised of a reading selection followed by multiple choice questions based on stated facts, implications, or general reasoning. Grade levels are available which made it possible to assess beginning reading rates with comprehension, and to keep track of progress during the year. Such testing can easily be done in groups with students being encouraged to accurately correct their own answers and to average scores at the end of each ten selections. Grade gains are an incentive. We use beginning and more advanced sections of Book D for 7th and 8th grades, and Book E in 9th grade. Current events articles in such publications as the National Geographic World and the New York Times School Weekly are read for information, vocabulary and concept development. Poems and plays are read for sounds of the language, for dialogue, and for fun.

Reading/Writing Workshop Book A, used for the 8th graders, includes

selections from well known authors for analysis of structure and style. After the deductive process of determining how such material is put together, students are asked to build their own inductive writing samples. This can be a good organizational process, as explained by Jan paul Miller, Associate Editor of The Orton Society Bulletin, at his Topic Session on "An Approach to the Diagnosis and Treatment of Problems in Written Composition" at The Orton Society 26th Annual National Conference in Santa Barbara, California in 1975.

Vocabulary development can be worked on from regular context as has been suggested. It can also be usefully done from books such as in the Wordly Wise series where short and long term memory, as well as word use, are developed. Supplementary work sheets can be devised where students pull details together for their own reviews, quizzes, or exams.

Samples of Vocabulary Development Material
from *Wordly Wise*, Book 4

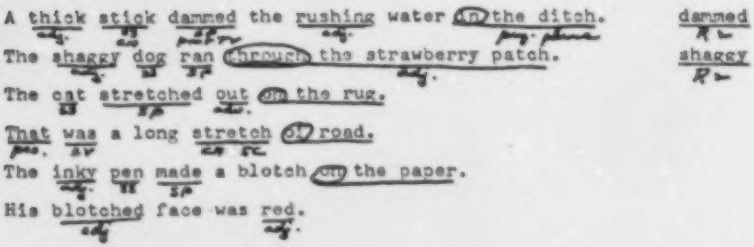
Underline Prefix/Suffix	Write original Prefix/Suffix	Write language origin and one Prefix/Suffix meaning for each word. Indicate suffix part of speech.
adapt	_____	_____
evoke	_____	_____
inhibit	_____	_____
prelude	_____	_____
deficient	_____	_____

The same word list can be used with heading *Write the meanings with* synonyms or word groups.

Students need frequent practice with oral and written spelling, and with dictated sentences with words in the language continuum. For students who may have some handwriting problems or auditory difficulties, it is vital to find out regularly how progress is taking place in the writing of sounds which have not previously been visualized. To find out if recall is accurate, ask students to write word groups, phrases, sentences, and paragraphs to determine whether a dictated sound sequence can be retained long enough to get it accurately down on paper. Proofreading is vital for learning to see and hear the clues for correct spelling.

The Warriner's English Workbooks are invaluable for reading, class dis-

cussion, and homework. I used the 7th grade text this year. Grammar application is constantly made from these books to the dictated material.


A thick stick dammed the rushing water in the ditch.
dammed
The shaggy dog ran through the strawberry patch.
shaggy
The cat stretched out on the rug.
That was a long stretch of road.
The inky pen made a blotch on the paper.
His blotched face was red.

Above are sample sentences that can be constructed. After the dictation is completed, a teacher can ask that the grammar labelings be completed. Flexible use of vocabulary is indicated by the words "stretch" and "blotch." Correction when done in class makes for good oral review.

The "Outlining" texts on the materials list are most helpful. Elementary means that it is the first book. We use these at 7th grade level. Outlines and summaries, as well as oral reading, are possible with both books.

Sound/spelling sheets need to be made up for practice and review:

1. Underline the digraphs in the following words:
   which thankful brashness entrench fussing fluff graph
2. Give sound patterns for the *ea* spelling.
   *wea*ther // gr*ea*t // p*ea*ch // and so on.
3. Finish the following words with correct spellings of *ck* or *k*.
4. Finish the following words with correct spelling of *ch* or *tch*.
5. Make doubling rule words from the following base words.

We make up practice sheets for *Digraphs in Syllable Division* and give the visual reinforcement of reading along with the kinesthetic practice of S.O.S. writing. Then we test spelling orally or in writing.

We also explain that many small words are prepositions. We use a sentence like: "I went to (from, in, into, along, behind, beside, through) the station," and then illustrate with an article like "The Quiet Comes" from the *New York Times*, 10/13/74, how an author gracefully uses such structure:

". . . Listen as you may, you never hear a maple leaf turning to translucent gold or an oak leaf turning from green to tan to purplish bronze. An October wind can bring them sailing from the trees and down the road, across the meadow, with a swishing crispness and a rustle . . . "

We find that not only dyslexics need help. More and more students lack basic English skills. New England public schools, private schools, and colleges are adding courses entitled Developmental English, English Competence, or Language Skills. Many adults need training sessions. Opportunities abound for those of us with structured English language facility to share our learning with others.

Written Expression—The Last Skill Acquired

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While grading a set of mid-term examinations, I was quite chagrined to find that the final page had become separated from the body of one student's paper. After a fruitless search, I attached a note stating that I was unable to grade the paper because I couldn't locate this final page.

After class a puzzled look came over the student's face as she read my note. Intuitively I knew that there was no last page.

The written answers on her paper were so poorly organized and incomplete that I had thought there there must be a missing link which would pull together the disjointed fragments. A few of the short answers were tangential, suggesting an inability to sort out and organize main ideas. The examination indicated that this student had gleaned little from the course lectures.

As the semester progressed, I noted that her questions demonstrated a keen understanding of the material. During the course, she presented a case study orally, and it was interesting, clear, and concise. When asked to express this same body of information as a written essay--a take-home exam--she was unable to convey her ideas at anywhere near the same level of sophistication. This is the real life situation of a graduate student demonstrating severe difficulty with written language.

Writing can be viewed as the final link in a hierarchical chain, with breakdowns occurring earlier at the listening, speaking, or reading levels. Discontinuity at any subordinate stage will seriously hamper efficient written language production (Johnson, 1968).

On the other hand, written language can be seen as the final link which can be learned in conjunction with, or perhaps in spite of various impaired links. This perspective suggests that written language may ultimately aid in the solidification of weaker links that should have been mastered prior to the

introduction of writing skills. Written language perhaps can bypass various stages in the language chain.

These considerations are not only academic. In a practical sense, they might suggest exactly how and when written language should be introduced to school age students.

Regardless of precisely where written language is located in the total schema of language acquisition, however, it is obvious that some unique prerequisities exist. Evertts (1975) views the facility with written expression as intrinsically more difficult than adequate oral expression. This student has completed college and has taken several other graduate courses. She is a successful, enthusiastic elementary educator.

Students whom I have encountered with this difficulty, even at the graduate level, generally plan their courses to avoid the odious task of writing papers and essay examinations. Experienced educators have encountered such students at virtually all levels in the educational system. They may appear (and be) bright, and can convey information through avenues other than written language. Oral expression, reading, spelling, handwriting, and organizational skills appear, on occasion, to be unaffected. With many students, however, one or more of these areas is also problematic and this will be reflected through a variety of deficits in the written language system.

In this paper, several specific aspects of the oral and written language of five children, diagnosed as dyslexic, are examined. Subtle residual difficulties appear in the oral language syntactical structure and in the children's semantic systems. In the area of written language, spelling is the most apparent deficiency. Word endings and punctuation are, however, often neglected and warrant serious appraisal. One of the most interesting aspects of the children's compositions is the low level of abstraction and the paucity of imaginative ideas expressed.

> Talking makes less demand on the syntactical sub-system of language than does writing. When talking, the sentence construction is more open. The speaker uses mazes, repetitions, false starts, and much oral editing as he watches for clues of understanding or confusion on the part of his listener. He can adjust the syntactical structures and word choices as he is talking (Evertts 1975).

Hughes extends this idea by calling attention to the written aspect of the language itself.

> . . . Writing requires the selection and utilization of acceptable forms for each letter in proper combination for the word. The fine discriminations, integrations, memory and coordination of hand, mind, and eye required for the act of writing are infinitely complex (Hughes, quoted by Myklebust and Johnson 1967, pp. 193–194).

Even though the educational practitioner is continually dealing with the developing skills of written expression, surprisingly little material actually describes the normal processes of acquiring written language. There have been a few notable exceptions in the recent literature. Burrows (1961) offers an excellent review of the literature on children's written language. Myklebust (1965, 1973) discusses normal written language development with examples of essays of children from 7 to 17 years of age. Many more pieces of children's writing need to be amassed before the jigsaw puzzle or written language development can document normal growth patterns and stages. The levels of abstraction and the complexity and variety of syntactical structure are some of the pieces which would be especially useful in assembling this massive puzzle.

One of the major reasons for this apparent lack of attention to written language perhaps can be attributed to the traditionally subjective nature of their evaluation. What, after all, "is" an A on an English class composition? Everts (1975) aptly sums up the kernel of the issue: "To write well is not a singular ability; it utilizes critical thinking, creativity, and a feeling for language."

Frazier (1968, p. 203) presents a logical framework for the teaching of writing. Each of his points can be viewed as a criterion for evaluating the effectiveness of written langauge.

1. *Relatedness of ideas within a sentence*
   Immature writing is typically a reflection of the linear nature of speech, with each new idea attached to the last as it may occur to the writer . . .
2. *Richness of detail*
   Immature writing is typically bleak . . .
3. *Precision of vocabulary*
   Immature writing is typically general or imprecise in its language . . .
4. *Variety of structure*
   Immature writing is typically composed of simple and compound sentences . . .

5. *Cohesiveness*
   Immature writing typically lacks words and expressions that tie sentences and even sentence parts together . . .

Frazier's points are worth keeping in mind while reading the children's compositions appearing later in this article. Mykelbust (1965) developed the Picture Story Language Test for assessing the written expression skills of children from ages 7 to 17. This instrument seems to me to be a particularly useful tool in the diagnostic assessment of written language skills, although its scoring is time-consuming.

Descriptions of written language disorders are quite rare especially when compared with the sheer bulk of material appearing annually on reading disabilities. Comprehensive discussions of various disorders of written language of children diagnosed as reading disabled, learning disabled, and retarded, as well as of children with various disorders of articulation and social-emotional disturbances, can be found in Mykelbust (1965 and 1973) and Johnson and Myklebust (1967).

Research and case studies on dyslexic youngsters appear frequently. Often a detailed description of reading, spelling, and handwriting is included; but little attention has been given to a systematic analysis of the actual composition skills of dyslexic youngsters. Although the sample size is small, Myklebust (1973) reports a comparative study of the written language of dyslexic and non-dyslexic youngsters. Because of the nature of this study, it is worth examining in depth. Fifty-nine males and seven females between the ages of 7 and 18.5 with WISC scores of 90 or above scored at the 25th percentile or lower on at least one standardized reading test. The children had normal vision and hearing. Positive neurological findings were detected in 83.8 percent of this population. In the area of written expression, story length was inferior for the dyslexic group when compared to a non-dyslexic population. Syntax scores were also generally much lower for the dyslexic children. Mykelbust (1973, p. 79) writes "Normal children acquired an adult level of syntax facility by 11 years but the dyslexic did not achieve this degree of success until 15 years of age. These findings reveal that the dyslexic children were deficient in auditory language training and thus could not normally learn to read and achieve success with written language." It is most interesting that the dyslexics in this population were not deficient in the Abstract-Concrete Scale for assessing the level of abstract concepts. Myklebust (1973, p. 79) states that these results warrant attention because they

suggest a cognitive learning style that is essentially different from the normal population. "The factors composing written language for the normal children may not be identical to those for the dyslexic."

There is no precise composite sketch available to us in identifying the dyslexic. In Baltimore County, Maryland, The Jemicy School's dyslexic population demonstrates an impressively wide range of skills and abilities in sports, art, academic, musical, and dramatic activities. This spectrum is just as broad as in any group of seventy-five elementary age children who do not have dyslexic traits. The Jemicy School dyslexic pupils are of normal intelligence, the full scale WI C IQ of each being 100 or higher. The children exhibit no debilitating emotional difficulties or other handicapping conditions. Vision and hearing are normal. After intensive remediation many of the children make substantial gains in reading. The 16 thirteen and fourteen-year-old dyslexics in 1975–1976, for example, range from 4.0 to 9.0 on the Gray Oral Paragraph (Reading) Test. Handwriting skills are varied. Mathematic skills, although varied, are generally average or above. Spelling is the single academic deficit area that these children share. On the Morrison-McCall Dictated Word List, the grade level range is from 3.5 to 6.0 for this same thirteen- and fourteen-year-old population.

These dyslexic youngsters demonstrate marked diversity in several aspects of written language. Examples of the children's performance on the Picture Story Language Test are most instructive when compared with several other aspects of language and academic performance. I have purposely selected five children whose written work best represents strengths and weaknesses that I have observed in many dyslexic students' written language.

Table 1 compares these five dyslexic youngsters with their non-dyslexic counterparts taking the Picture Story Language Test. Total words, total sentences, and words per sentence evaluate what Myklebust terms "productivity." Syntax focuses on word usage, appropriate word endings, word order, and punctuation. The Abstract-Concrete Scale attempts to assess story content by looking at the level of abstract ideas. Note that story length both in terms of number of words and number of sentences is generally low. A full range is represented on the abstract-concrete scale. Examination of the actual compositions will prove useful in understanding this scale. Number of words per sentence and syntax were significantly below the level of the non-dyslexic population. Generally these children used few complex sentences. Adjectives, adverbs, and conjunctions other than *and* were also infrequent. Interestingly enough, word order in Cases 1 and 5 showed flexibility whereas Cases 2 and 4

Table 1. Picture Story Language Test
Percentile Equivalents by Age

	Age	*Total Words*	*Total Sentences*	*Words per Sentence*	*Syntax*	*Abstract-Concrete*
Case 1	14.7	5	15–20	25–30	6	*
Case 2	13.6	30–35	50	30	10–15	98
Case 3	13.6	5–10	25	20–25	2	8
Case 4	12.3	20–25	50	10	50	16–17
Case 5	14.4	95–98	95–98	35	40	95

*Indicates that the composition was not comparable to the test standards

tended to rely on subject verb order in simple, declarative sentences. Case 3 illustrates word sequencing difficulty. Punctuation was an area of weakness for all the youngsters. Appropriate use of word endings was a problem for Cases 1, 2, 3, and 4. Similarly, these same children often misused the article *a*. A closer inspection of the writing samples should further illustrate the diversity as well as common sources of difficulty. Let us first, however, look at the children's academic performance and their responses to certain oral language experiments.

Table 2 shows the children's current grade levels on standardized tests for reading vocabulary, reading comprehension, decoding isolated words, arithmetic computation, oral reading accuracy, spelling, and handwriting. Form D of the Gates McGinitie Test is given to children in grades 4 through 6. Form E is for 7th through 9th grade students. Note that oral reading accuracy as measured by the Gray Oral Paragraph Test lags behind comprehension as measured by the Gates McGinitie. Spelling is a deficit area for all of these children whereas arithmetic is more variable.

Table 3 shows the results of the children's performance on specific oral language structures as tested by an instrument devised by Carol Chomsky (1969) in an attempt to pinpoint some of the structures that develop for many children between the ages of 5 and 10. The last two columns of Table 3 contain the Syntax Scale and Words per Sentence in percentile ratings so that a quick comparison may be made with oral expressive language.

Table 2. Grade Levels on Standardized Tests

	Age	*Gates McGinitie Form*	*Vocabulary*	*Comprehension*	*WRAT Reading*	*Arithmetic*	*Gray Oral*	*Morrison-McCall*	*Ayers Hand-writing*
Case 1	14.7	E	7.3*	11.0*	7.5	7.0	4.9	4.1	–
Case 2	13.6	E	6.2	7.9*	7.0	10.7	5.1	5.8	9.4
Case 3	13.6	[illegible]	8.0	7.1*	5.5	5.9	5.1	4.7	7.5
Case 4	12.3	D	8.8	7.6	7.7	5.9	7.0	5.4	–
Case 5	14.4	E	10.3	11.7	11.3	7.6	8.6	5.8	–

Notes: Dashes indicate that the child did not take test.
Asterisks indicate that test was administered on an untimed basis.

Table 3. Performance on Oral Language Structures Test

	Age	*Ask–Tell*	*Promise*	*Easy See*	*Pronominalization*	*Syntax*	*Words per Sentence*
Case 1	14.7	+	+	+	+	6	25–30
Case 2	13.6	+	+	+	+	10–15	30
Case 3	13.6	+	+	+	–	2	20–25
Case 4	12.3	–	+	–	+	50	10
Case 5	14.4	+	+	+	+	40	35

In the "ask/tell" experiment (Chomsky 1969, p. 50), the child had to distinguish between asking and telling:

Ask John what time it is.
Tell John what color to make the square.

In general, Chomsky states that the ask/tell structures gradually improve with age although she suggests the possibility that this particular structure may never be fully acquired by some children.

Once determined that the child understands the word *promise*, the "promise" constructions (Chomsky 1969, pp. 32–35) were tested by having the child listen to sentences and manipulate the appropriate figure, Mickey Mouse or Donald Duck, to demonstrate comprehension:

Mickey tells Donald to hop. Make him hop.
Donald promises Mickey to do a somersault.
Make him do it.

The "easy-to-see" construction (Chomsky 1969, pp. 24–27) was tested by placing a blindfolded Donald Duck in front of the child. He was asked to indicate whether the duck was easy to see or hard to see. The youngster was then asked to make the duck easy or hard to see, depending upon his first answer. If he said initially that the duck was initially hard to see and consequently took off the blindfold to make it "easy to see," he demon-

strated that he had not yet mastered this structure. Questions were asked to further ascertain this fact.

"Pronominalization" (Chomsky 1969, p. 104) tested the child's knowledge of restricted reference where the pronound must represent a noun outside of the sentence.

He found out that Mickey won the race.
He didn't know why Pluto felt so sad.

Keeping in mind the percentile scores on the Picture Story Language Test, academic performance, and the children's performance on the Chomsky experiments, let us now examine writing samples of these individual Jemicy pupils in detail.

Case 1

The Avige Business Man

This picture shows an avridge business Man hard at work on his coffee hour. This bussiness Man has the finest eagipmint under his contrul. When I asked him what brand of eagipment he uses, in his on words ke said 'bab: ow' Trans lative it is Play Tell. With this eagipment he made dining rooms living rooms and maba more.[1]

In this case, spelling is such an obvious area of difficulty and errors are, in fact, so blatant that it might become *Scylla* ensnaring the educator to overlook other aspects of this pupil's written work. Note, for example, the inappropriate suffix *-tive* on the word *translated*. Noun verb agreement is also a problem, "He make dining rooms." Punctuation and erratic use of capital letters in this essay suggest that sentence structure needs solidification, but basic paragraph structure is intact for short compositions. If, however, spelling errors are eliminated and punctuation and grammar are the sole bases for evaluating a child's written performance, the educator is endangered by *Charybdis*.

[1] The black and white photograph from the Myklebust Picture Story Language Test shows a youngster approximately 5 years of age dressed in a white shirt, tie, and suit sitting at a table playing with dolls and a doll house. In all five cases the children responded to this picture.

The Average Businessmen

This picture shows an average businessman hard at work on his coffee hour. This businessman has the finest equipment under his control. When I asked him what brand of equipment he uses, in his own words, he said, "Bab ow," translated it is, "Play Tell." With this equipment he makes dining rooms, living rooms and maybe more.

The delightful sense of humor and level of sophistication in this 14.7 year old boy's response to the stimulus picture is impressive. He is obviously not lacking in creativity or the ability to sustain an idea in a very succinct, tightly structured paragraph. These aspects of his written work should be encouraged while he is getting instruction in the mechanical aspects of writing. Receptive and expressive language are particular strengths. Sentence structure, word usage, vocabulary and content are quite in keeping with his superior intellectual environment. None of the grammatical difficulty evident in his written work is present at the oral level. This youngster works very slowly in academic tasks such as decoding words and computing simple arithmetical problems. When he is given adequate time, reading comprehension is excellent. Mathematical concepts are also quite sophisticated when measured on an untimed basis.

Case 2

The 13.6 year old dyslexic girl who wrote the composition below has had four years of intensive language remediation using the structured Orton-Gillingham Approach. Note the persistent difficulty with small words, *bow/who*, the paucity of punctuation, and the difficulty with word endings. The articles *a* and *an* have not been mastered. These areas of difficulty contrast sharply with the clear, logical story and the concepts expressed. The story content is much more in keeping with her bright-normal functioning level on the WISC. The comparison was written in a rough draft, proof-read, and recopied. I suspect that this took her at least twice as long as it would have taken her non-dyslexic peers.

Once upon a time there was a boy how was a orfin. The man incharged of the orfin was very disterb about the little boy's behaver. He asked the little boy to see him in his office. The boy was waiting for the man. While the boy was waiting he was a bonch of dolls on the table. He

started to play with the dolls. When the man came in he asked the boy what are you doing the boy said, "This is what I liked my life to be like. To be in a family and have brothers and sister and most of all a Mother and Father."

Oral language is also an area of difficulty for this girl. I have found that in working with oral language, a TV quiz show can easily be adapted for classroom use. It offers a great deal of value in determining the child's language facility in a situation where automatic skills are required. This girl evidenced difficulty in rapid word retrieval, directional confusion, and concept reversals. For example, she was given the clue, "You wear it around your neck," and responded by saying, "Bracelet." She had to give a clue for doctor. After much hesitation and several false starts she said, "Male nurse." In her spontaneous language, non-specific words and phrases are frequently used instead of precise labels.

Case 3

This 13.5 year-old boy has a history of delayed language development. Short attention span, difficulty following verbal directions, and poor letter recognition were observed in the first grade. At the age of 9, an extensive language evaluation cited word-finding difficulty and inadequate auditory closure to be major areas of need. Word-retrieval problems as well as inconsistent discrimination among several voiced and unvoiced consonants is still evident in spelling and oral reading. Note that this youngster had difficulty with Chomsky's pronound constructions (Table 3). The pattern of cognitive functioning is also indicative of specific language disabilities: WISC Full Scale–117, Verbal–108, Performance–125. This student shows occasional difficulty when attempting to formulate a question spontaneously. He was given the direction:

Ask Chris what to give her next.

His question was:

Chris, what to give her next?

On the next similar question, he was able spontaneously to self-correct:

Ask Chris what to feed her.
What to feed her now? What should I feed her now?

The students' written language production reflects some of these problems:

The day is 1972 year January.

The little boy has a problum like all little boys have. By the way his name is John. Johns probum is he has a fantassy about if he was a little lamp. He always wood be tund on and off. Or if he was a Jennie in the lamp. When he the lamp was tund on he would popout Wented he has a lot of friends.

Poorly sequenced ideas initially give the impression that the composition is nonsensical. When I asked the youngster to go over the story with me to clarify ideas, the results were quite interesting:

The Month is January—The Year is 1972

The little boy has a problem like all little boys have. By the way, his name is John. John's problem is that he has a fantasy about if he was a genie in a lamp or if he was a little lamp. He always wounded by turned on and off. When he, the lamp, was turned on, the genie would pop out and he would have a lot of friends.

"Talking out" the ideas is a great aid to this boy. At this point he is not able to sequence or clarify ideas independently. He still shows word-finding difficulties in both oral and written language. Nouns are often non-specific and there is a paucity of descriptive words. When he was shown a picture of a spider on a web, for example, he said and then wrote:

The bug is climbing up the web to his house.

Writing lags behind oral language when the exercises involve writing a whole composition or expanding sentences. When this boy was given a picture of a man trying on a hat he said:

The traveling man is tipping his hat.

He was then asked to expand the sentence by telling *why*. He wrote:

The traveling man is tipping his hat because he cool some girl he mit want to date.

When asked to give an oral sentence, he said:

The traveling man is tipping his hat because he wanted to be cool to some girl he might want to date.

Case 4

Written Expreion

One day George had nothing to do and he was very lomly. He was looking all over the house. Then he went into the play room. And he said something strange it looked like a box. George had never seen a lox that was that beautitiful. He opened the lox and had saw a whole lot of toys. And that meant lots of fun for the whole day. And that is the end of the loring day
(Underlined m's were written with 4 humps.)

This is the composition of a 12.3 year old boy with handwriting and oral language difficulties. Several aspects of written language are also a problem. Note the confusion with *m/n* and *b/l* throughout his written work. Sentences are short, descriptive words meager, and punctuation inadequate. Classroom work demonstrates his areas of specific need more clearly. When asked to look at a picture of a ladybug on a boy's arm he wrote:

The boy had picked up the catipillar and had put it on his arm and looked at it.

When looking at a cartoon of a dog reaching towards a piece of ham, the youngster gave this simple unadorned sentence.

The dog is hungry for ham.

When asked to expand the sentence using the word *because*, he said:

The dog is hungry for ham because he ran up a tree.

He could not self-correct his sentence spontaneously, or when he repeated it, or when it was said to him at a normal pace. Even saying it at a slower pace produced no results. He was then asked to write the sentence. He finally chuckled to himself and said, "Dogs don't climb trees."

Other samples from his written work show that he has developed the concept of a simile. He looked at a picture of a boy hitting a baseball and wrote:

When the loy hit the Ball it looked like a spark.

Case 5

This dyslexic youngster obviously enjoys creative expression. On the Myklebust scales for the Picture Story Language Test, he is between the 95 and 98 percentile level when compared with his non-dyslexic peers on Total Words, Total Sentences, and Abstract-Concrete. In contrast, Syntax and Words per sentence are strikingly low. This student has received remedial language learning help through the elementary grades. For the last three years he has had small group and one-to-one instruction in all subject areas. He now enjoys reading and is performing comfortably above grade level although speed remains somewhat slow. Spelling and arithmetic continue to be areas of difficulty.

The story that this 14.5 year-old wrote is well-structured and sensitive. Plot and overall organization are particular areas of strength. Note also the allegorical vehicle for conveying a moral issue.

Once there was a boy who always liked to play with dolls. After from playing with them so long he started to believe that they were real.

The other boys always made fun of him. He didn't have any other friends exsept these old dolls, but he loved them more than anythink else. These dolls wern't baby dolls they were little plastic dolls. They were all a family they had a car. a dog. firnetine [furniture]. they had about anything a doll family would want.

One day he was putting the dolls away when one fell off of the table he heard something say ouch in a little voice. When he looked over the table the little doll was rubbing her eyes and tears were dripping off of the end of her noise. He bent down and when he totched her she turned back into plastic.

He picked her up again and droped her again. She started to cry.

Then he picked up the whole box and dumped everything on the floor. Every doll started to cry. He started to run feering that the dolls might run after him but on the way he tripped over a toy and every thing went black.

The next thing he new he was all tied up with sewing string. All of the dolls were dancing all over him. All of the dolls had come alive.

Of course sewing string isn't going to hold a person down so he just stood up and dolls flew everywhere. They jumped in there car and started to rip around the room. The boy grabed the car by the bumper and all of the dolls and the car turned into plastic. Unforch intly the car didn't have a bottom and all of the dolls fell out the bottom. He put all of the dolls away and put them up in the attic. From then on the boy played baseball with all of the other boys insted of playing with dolls.

His mother could never make out the little voices that said He believe in us so much that we came alive. And by that we could make him not like us so much so he would be like the other boys.

This boy's punctuation, spelling, and sentence structure continue to need attention. Oral language is generally an area of strength. The results of Chomsky's interview procedures were interesting, however. When given sufficient time, he was able to perform adequately but when the questions were asked rapidly, he became confused and asked for them to be repeated. He also had difficulty in formulating questions automatically:

Q. Would you first ask Bill what to feed Donald Duck.
A. What to feed Donald Duck?
Q. Ask Bill what to feed him.
A. What to feed him now?

As the interview progressed, he spontaneously self-corrected this question structure, but some difficulty persisted:

Q. Ask Bill what to put back next.
A. What should I put back next, now?

Summary

These five cases illustrate several important facets of oral and written language skills of dyslexic youngsters. The children all evidenced difficulty with syntax and number of words per sentence. Perhaps punctuation symbols create specific problems for some youngsters in much the same way that the

alphabet symbols caused initial difficulty for them in the reading process. All of the children, except Case 4, worked quite slowly regardless of the end product. This time factor would be worth investigating further.

All children except Case 1 evidenced some difficulty with oral language. Cases 2, 3, and 4 showed varying degrees of difficulty. These three children have specific difficulty with word retrieval and generally lack precision in oral language. Non-specific words and circumlocutions appear often. It is interesting to note that Cases 3 and 4 have not developed some of the syntactical structure that Chomsky suggests become stabilized between the ages of 5 and 10 for many children. Further attention to this area should be given with a larger group of children. Case 5 was originally included because of the productivity and level of abstract ideas in his written language. It was interesting to note that he, like Case 3, had difficulty in spontaneously fomulating questions.

Conclusion

These dyslexic youngsters were particularly weak in syntax. The level of productivity, the abstractness and originality of ideas were diverse. Results of Table 1 differed somewhat from Myklebust's study and warrant further attention with larger groups of children. The subtle difficulties noted in spontaneous oral language should be explored further. Case 4 had the most difficulty with oral language. It is quite possible that written work is helping him monitor and clarify his oral language. With Case 3, the opposite seems true—oral language is perhaps aiding him in the sequencing of written language.

In many respects, this paper has raised a myriad of questions and offered no answers. I believe, however, that it illustrates that written language is, indeed, the very last skill acquired by many youngsters.

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Language and Learning Therapy in a Community College

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The Community College of Allegheny County has become involved in clinical language and learning therapy because we recognize diverse needs among our heterogeneous, "open-door" population and our own need to respect the educational program we offer. The college is only seven years old, the faculty is young and energetic, and the community college concept still calls forth the pioneering, trouble-shooting spirit with which it began. The mission of the college is an extraordinary challenge: to offer high-quality, low-cost education to the community's residents, especially those who before would not attempt college.

South Campus is one of four county campuses of the Community College of Allegheny County, south of Pittsburgh, Pennsylvania. The Campus serves 3,800 fulltime students, capacity enrollment for this phase of our development. The average student age is 22 or 23 years; 60 percent of the students require financial aid to meet tuition of less than $400 a year; educational backgrounds and achievement levels vary so as to defy categorization. Almost one quarter of the students are enrolled in developmental (pre-college level) courses in reading, writing, and mathematics. Although there are three pre-college levels, the "lowest" is beyond the reach of a good ten per cent of our students!

Early attempts to deal with language deficiencies in a laboratory setting exhausted the energies of those teachers who added the job to full class loads;

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and released time, materials, and compensation could not be provided. While the laboratory could not survive, a clear sense of its functional necessity did. Certain propositions seemed to us self-evident:

1. Language deficiency is the single, most formidable deterrent to educational opportunity.
2. Language ability is closely related to school "savvy"; the uninitiated who cannot use language-based strategies seldom can organize learning in any college subject.
3. Progress in reading and writing leads to an overall improvement in grades.
4. The high risk student is a whole person whose image of himself as a communicator is largely his image of himself as a student.
5. Students are the best diagnosticians of their own language weaknesses.
6. Language skills cannot be taught successfully piecemeal: relationships to learning in general, personal goals, and career planning must be integrated.
7. An atmosphere of advocacy, human concern, firmness, and honesty is essential for successful intervention and remediation.

Two years ago the resources for dealing with students' learning difficulties came to us in the form of state funds under the Vocational Opportunities Act. An annual budget of about $80,000 provides materials and most of the staff described here.

Four full-time specialists in basic skills areas—reading, writing, math, and science—who work individually with students showing deficiencies at any level.

Three part-time professional tutors—reading, writing, math-science—who team with the specialists at peak hours.

A part-time psychologist who does diagnostic counseling and psychological testing for referred students.

A part-time Language Disabilities Diagnostician-Therapist, who works on a case-load basis with student referrals.

A full-time Counselor who works both on a case-load basis and at large.

A full-time Assistant to the Coordinator (a graduate of South Campus) who trains and supervises peer tutors.

A Peer Tutor Corps who provide course review tutorials and backup for the specialists.

While the responsibilities of each staff member are clearly delineated, in actual practice the only exclusive domains are those in which specific expertise or experience is mandated. Each staff member is aware of the overall goal—to help students become good, independent learners—and contributes to it. The team approach is reinforced formally with weekly staff meetings, monthly staff meetings with a psychologist-consultant, and periodically (during school vacations) with in-service workshops on learning theory and learning-language disability.

More than 500 students are served per semester. Approximately 100 of those are severely deficient in language and learning skills; about 30 have been professionally diagnosed as learning-disabled. The majority of our students spend no more on the average than an hour or so a month in the Center; about 50 are scheduled for on-going work each week; a few, every day.

The Center itself—officially named the Learning Assistance Center, but popularly called the Survival Center—is housed in a suite of offices whose anteroom is furnished with tables and chairs where students can work or relax. A nearby classroom has been converted into a writing workshop; the counselor, the diagnostician, and the psychologist each has an office available when privacy is important. The main Center, the suite, is the hub, however; there is only subtle distinction between the open arena and the doors that must occasionally close.

Those students whom we serve, both regularly or occasionally, do not feel the deadly stigma special attention groups so often feel. We think there are three chief reasons for this:

1. Peer tutors, solid students with solid self-confidence, are associated with the Center. They not only tutor, they also ask for help with their course work when they need it . . . and they spread the word.
2. The faculty (most, not all) support our efforts. They recommend us to their students, to troubled students, and B-students who want A's.
3. There is not a member of the staff who cannot or will not admit that at one time or another he messed up something, failed something, or had to struggle to learn something. The feeling is that no one has less than one deficiency somewhere, some deficiencies are hidden, some are obvious, and anything that is can turn for the better. (We are frankly outraged when the honest, the healthy, and the positive are not credited as forces in education or are dismissed as sentimental.)

Most of our students are self-referrals, and a large number are friends of other students. Faculty referrals comprise the rest; however, faculty referrals

don't always show up! We also encourage a limited number of referrals from our contacts largely maintained by our Advisory Committee. Referrals in this group come from several agencies: local high schools, the Bureau of Vocational Rehabilitation, the Veterans Administration, the Justice Commission, community family services organizations, and the like. The appropriateness of a placement is up to us, and we make that decision based on the diagnosed potential of a referral to eventually join the mainstream of the college and to make use of its academic and vocational opportunities.

The program of services is unified in the approach that serves the severely disabled learner as well as the mildly rusty or inexperienced student. Basically the approach consists of problem-solving training, helping the student to develop a plan or a series of strategies to get from where he is to where he would like to be. The skills' breakdown bears close resemblance to the technical plan used by the therapist as well as to the "game plan" used by the model student:

1. Determine a starting place. This is accomplished by conversing with the student (more often than not, he will tell you what is wrong), by diagnostic teaching, or by more formal diagnostic measures. We may focus on a specific area only, or develop a profile of widely based performance levels. Aside from the specific language tests mentioned later, we most often use, to determine performance levels, the Michigan Tests of Basic Adult Education, the McGraw-Hill Basic Skills Diagnostics, the writing sample, and "real" tests donated by instructors who have developed them for classes to determine performance levels.
2. Fill in background. Past performance records (perhaps no more than the student's general report of his past successes and failures), his college grade record, his placement test scores (the Comparative Guidance and Placement Tests, ETS, and the Nelson-Denny Reading Test are given upon entrance to the college), his class notes, and his previous tests in one or more courses. Later on, we may seek out high school and elementary school records, medical records, and psychological records.
3. Focus on the moment; order priorities. What is needed at once varies from quick, "band-aid" work on a confusing mathematics problem, to gentle encouragement to the student to surrender chunks of his available time for the purpose of getting down to the heart of a more serious problem.
4. Build some strategies. By mutual agreement, the student and his

tutor, specialist, or therapist, set a goal and analyze the steps towards reaching it:

A. Label the problem, type it, categorize it.
B. Set up the knowns and unknowns.
C. Deal with the limitations of time, decide how far to go.
D. Clarify vocabulary.
E. Set up steps to a solution, or landmark.
F. Work through the steps, verbalizing as far as possible, the slow-going spots.
G. Evaluate the results.
H. Review or summarize the problem and the method.
I. Look for applications of the method to other problems.

5. Intervene, if necessary. A student may need a little more time to complete an assignment, a different setting for a test, an alternative mode—whatever. Whether he needs permissions, extensions, or excuses, the Center may have him get them or arrange them for him.
6. Follow up. Any member of the team can strengthen his own understanding of process by recording what took place. Later work depends on a careful recap of what has happened. All work with any long-term student is studied, and summarized, and recommendations for future work are made at the end of each funding period. Should the project be discontinued for any reason, our clients can move ahead to alternatives which we have discussed with them.

The Learning Assistance Center, then, is emerging as a microcosm, reflecting almost all facets of the college, emphasizing *time* and *depth* of individual attention. The sweeping job of outreach carried out by the college under the headings "Recruitment" and "Community Service" occurs on a personal basis between someone from the Center and someone on the fringes. The instructional methods of the classroom which work for most students most of the time are adapted as needed. The follow-through on the students we serve, involves more time, more detail, and more personal contact.

The language instructor finds with the dyslexic adult a motivation for learning that is a strong asset in the early stages of therapy. Most adults, although self-referred for remediation, are nevertheless wary and doubtful of their ability to learn very quickly. The good teacher must be able to develop a relationship which will put the adult at ease while tapping the language experiential base which will provide rapid gains in learning and thus maintain motivation.

During the past two years more than one hundred students have been diagnosed in our Learning Assistance Center as having some degree of language disability. Certain patterns emerge as general characteristics of dyslexia in adults. By the time the student has achieved junior college status he has usually mastered many of the basic phonetic skills for reading. However, these skills may be somewhat fragmented, and difficulties frequently exist with advanced syllabication. In addition there is often confusion with structural endings and with short vowel sounds. The dyslexic adult is usually a slow reader, frequently needing to read a passage several times in order to understand what he has read. Substitutions and repetitions are fairly common, even occurring on reading passages where the adult is able to pronounce all the words. This slowness in reading, coupled with substitutions, repetitions, and insertions has an inhibiting effect on the student's ability to derive precise meaning from what he has read.

The spelling of the dyslexic adult quite often resembles the patterns of his oral reading. Even if the adult has learned to decode words for reading, he still may be unable to spell them. Furthermore, specific spelling errors can indicate an earlier problem in learning to read. With spelling the dyslexic adult may have difficulties with letter and/or syllable sounds in the right sequence, lacking consistent phonetic knowledge to unite sounds in order. He may try to spell words phonetically without appropriate attention to visual components and categories. On the other hand, some adults are neither "phonic" nor "sight" spellers, and so they guess randomly at words. There are difficulties with syllabication, confusions with structural endings, difficulty in phonic quality of syllables and problems with letter sequences in words normally recalled by sight. Spelling difficulties can inhibit the student's ability to transmit information; he may be reluctant to write words that he understands and uses in oral communication, because he is unable to spell them.

The following characteristics are frequently observed in the assessments of written language in our Learning Assistance Center:

1. Inability to take class notes from reading or oral presentations rapidly and/or legibly. Frequently the student has problems reading and studying what he has written.
2. Difficulty in formulating generalizations and selecting and using details to support the overall topic.
3. Word and/or word-part omissions, sentence fragments or run-on sen-

tences indicating problems in attention to detail and completion of thought patterns.

4. Redundancy in sentence construction with one pattern used predominantly—usually basic noun-verb pattern. Difficulties may be exhibited in the varying of sentence constructions.
5. Difficulties in establishing coherence through transitional words, phrases or sentences.
6. Problems in formulating an overall plan and structure for writing purposes.
7. Difficulty in using verbs expressively or varying use of verbs. Problems may also occur in use of a variety of descriptive words, (adjectives and adverbs) with appropriate agreements.
8. Difficulties in use of appropriate punctuation signals for writing.

The instructor must analyze the frequency and degree of difficulty in the above categories, rather than focusing upon a single characteristic to indicate that a problem exists.

The proficient learner is usually able to relate concepts that he learns in the various subject matters and to understand relationships involving generalization or abstraction such as relating the literature of a period with its history. The dyslexic adult may not be able to "tie together" the various subject matter concepts in the college curriculum, particularly those concepts derived from reading. Often he has difficulty memorizing terms, lists, etc., since he has not developed the mnemonic devices which the more proficient learner appears to develop. In addition the dyslexic student may exhibit difficulties in determining what is expected or required in test-taking, organizing information, studying for different types of tests, formulating answers as determined by question content, and assessing an instructor's prior expectations regarding the test itself. Essay tests, requiring the individual simultaneously to formulate specific answers within a broadly-based outline while developing this in structured written form, can be particularly difficult for the dyslexic adult.

Several yardsticks are used in our diagnostic component to assess learning capacity. Often the dyslexic adult possesses fragmented information about school-related ideas, most likely due to lack of reading skills when the information was presented and also due to time away from school; thus, he may not score well on verbal intelligence tests or tests of general information. A careful item analysis is made of the subtest results of the psychological testing instrument.

Since most of our dyslexics are taking courses within the mainstream of

the Campus, as language instructors we find ourselves working at several levels simultaneously. The main thrust of instruction in reading initially is to develop accuracy in word pronunciation skills with supportive emphasis in notetaking, reading comprehension skills, spelling, and writing. Phonetic knowledge is developed and refined through spelling and dictations, and syllabication skills are taught directly through word attack exercises related to word lists or selected reading passages. With respect to reading we concern ourselves with (1) phonetics and syllabication, (2) vocabulary development, and (3) reading for varied purposes.

Language therapy begins with review of the short vowels presented in detached syllables which are read and written from dictation. The student is presented with a reference chart for the vowels which is written on the front page of the notebook with either a key word, picture, speech position, or combinations to help with recall of the sounds. In addition the student reads with pencil in hand from practice with detached syllables to multisyllabic patterns and text readings. We have found "penciling" and the use of a vowel chart, both described by Ansara in her article "Salvaging the College Potential of the Dyslexic Adolescent," in the 1973 *Bulletin of the Orton Society*, to be very helpful in establishing accuracy in reading. The short vowels are presented within the first three to five sessions, but continue to be reinforced through dictation at the beginning of each session until responses are automatic for both reading and writing. If the syllable is read incorrectly, the student is requested to trace over it and then write it several times repeating the sounds.

Syllabication practice begins almost immediately. With the use of a vowel reference chart and the initial presentation and written reinforcement of the vowels, the adult is able to read multisyllable words very quickly. The use of a pencil for focus helps to minimize confusion. Most of our adults know the sounds of the single consonants and consonant teams, such as th, ch, etc.; occasionally, however, we may need to review and reinforce the consonant teams. We present four main syllabication principles which are expanded with structural endings in a step by step process beginning with closed syllables, short vowel patterns; ending sounds are taught as needed.

PRINCIPLE 1—Closed syllables

Sample List

dispatch	transmit	impend
candid	distill	accomplish
establish	admit	submit

Expanded with Endings

dispatcher	establishment	accomplishment
admitting	transmittance	submitted

PRINCIPLE II—Final E (Has the Effect of Making Previous Vowel Long)

pute	voke	vade
fuse	pete	pose

Expansions from Final E

compute	invoke	invade
confuse	compete	impose

Expansions with Endings

computing	involving	invaded
confuses	competed	imposed

PRINCIPLES III—Open Vowel (Division between Vowel and Consonant)

deduct	propel
potent	vacate

Expansions with Endings

deduction	propelling
potential	vacation

*Multisyllable Combinations**

economize	fabricate	illustrate

Multisyllable Expansions

economization	fabricated	illustrating

PRINCIPLE IV—Vowel Division (Each vowel has a separate sound. Try the fir

poet	riot
create	science

Expansion from Vowel Division

poetical	riotous
creation	scientific

We find as we proceed through the stages outlined above for syllabication, while we develop and reinforce phonetics through dictation and spelling, that most of the adults can move rapidly to reading texts at standard adult reading level. They may still need to read slowly and focus with a pencil; however, the instructor will seldom have to use "high interest, low vocabu-

*Here the student is asked to "try it short, long, or in-between."

lary" readers for instruction. Text reading for syllabication practice is not attempted until the stages outlined above have been developed. Most of our students can apply the principles outlined in these stages in approximately eight weeks of daily lessons. When it is impossible for the instructor and student to meet, review tapes reinforce the lessons. In fact, all lessons are taped so that the student can practice reading and dictations. The use of taped lessons provides necessary reinforcement, excellent utilization of time, and allows the student to proceed more rapidly through the stages described.

When syllabication is applied to text reading, the language instructor determines the readability level using the Flesch formula, and charts the progress for the student. In most cases the student is able to read material at standard adult reading level which continues to provide motivation. We do advise, however, that spelling and writing skills will take considerably more time to acquire, but once the rapid reading gains have been made and a foundation of phonetics through dictation reinforced, the motivation and maturity of the adult provide the continuing impetus for developing competencies in written language.

While the student receives individualized language therapy, he obtains special support assistance for a variety of survival skills discussed in the first part of this article. The student can tape his lectures, receive instruction in study skills and test-taking; he is often allowed to write his papers or take written tests with the help of the language therapist or peer tutor.

Motivation and maturity provide a strong foundation for successful teaching of the adult dyslexic. Nevertheless, it is essential that a structured, carefully prepared language therapy program be instituted to provide opportunity for the adult to make rapid gains. The initial spark of motivation is easily lost if the adult is presented with elementary readers or the traditional methods which did not work originally. It is possible for the adult dyslexic to master new language skills at a fairly rapid pace because of his experience with the spoken language and his ability to work within a conceptual framework, given a consistent pattern of instruction.

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Living with Children in Home and Classroom

These two papers are written primarily for parents and classroom teachers who have not had previous experience in the identification, assessment, and teaching of children whose difficulties in school stem primarily from language-learning ineptitude. Dr. Caplan's practice has included many constitutionally hyperactive youngsters, while Dr. Wood has been concerned with the full range of public school children. Each is involved with children with learning disabilities of various and often overlapping kinds. Each recognizes the very special needs and potentialities of the large and individually varied group which is the special concern of the Orton Society, grouped for convenience under the rubric, "specific developmental dyslexia."

These papers address themselves primarily to problems of home and classroom *management*, suitable to all children, including those with primary language learning problems. The specifics of *diagnosis* and *teaching* dyslexics are not addressed here, not because they are unimportant to everyone concerned, but because they require a somewhat different and more professionally specialized focus. Children with language-learning difficulties are, after all, whole people in their total settings, with many needs in common with everyone else. These papers should help us keep this holistic aspect in mind as we address ourselves to the particular problems that bring us together as readers of the *Bulletin of the Orton Society*. Comments from readers are invited.

—The editors

Helping Parents Help Their Children

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If you are a parent, a teacher, or a professional who has to decide how to help a child with a learning or behavior problem, it is helpful to ask three questions: 1) How do I tend to react now to the child and the problem? What is my style of response? 2) How do children see the world? 3) Given an understanding of my own reaction to this child, and given an understanding of how children view the world, then what can I do about it? How can I modify my own behavior in order to help the child?

In thinking about one's own reaction to a child who has a problem, one approach to the task is according to a scheme proposed by Karen Horney (1966). She noted that there are three basic ways to deal with a situation or a person: to move toward, away from, or against. Each of these responses can be good or bad, depending upon how extreme they are and depending upon the situation. The most common form of moving against a child is anger. It may be anger with the child, or anger with yourself, if you feel responsible. If you move away from the problem and the child, then you can ignore the child or deny that there is a problem. Moving toward the child at first sounds like the most preferable of the three styles, and of course it is, if done in a healthy way. But moving toward can take the form of pity, or overindulgence. It may seem that your primary concern is the child. But, if you believe that that is the case, it is important to consider whether you feel real sympathy for the child. Do you overdo it? Do you behave so permissively that the child will develop kinds of behavior that will cause other children and adults to despise him or her?

In thinking about your present style of responding to your child, ask yourself, first of all, what you praise, blame, or ignore about your child. Consider very carefully and analytically the child's behavior, achievements, and misbehavior, and the embarrassing or upsetting things he or she does, and whether you tend to praise, blame, or ignore them. The first task, then, is primarily one of knowing and thinking: to develop in your mind a clear

picture of your own behavior and of your varied responses to different aspects of the child's personality and behavior.

Secondly, once you have done this, you can then ask yourself: "In each situation, with each kind of behavior or attribute of the child, what is my reaction about? Who is it for? Is my reaction for the child's best good? Or is it done to meet my own needs, such as anger or guilt? Or is it done to protect, to blame, or otherwise to affect somebody else, such as the child's father, the child's mother, the brothers and sisters, or teachers? All of these responses are common and natural. You don't need to feel guilty about them—just, for your child's sake, to be aware of them.

The work of answering these questions begins in a thinking, rather than a feeling, way: You sit down and make a list. But soon, and inevitably, things get in the way—your feelings, your usual style of dealing with problems, with situations that embarrass you or irritate you, that fail to meet your expectations or standards. If you are like most people, answering these questions about how you react to your child is made easier by talking with someone else. This could be another parent, the child's teacher, a psychologist, a psychiatrist, a social worker, a minister, or other helping professional. You can say to this person, "Here's a list of how I treat my child under various circumstances," or "Please come and watch me interact with my child, in order to help me figure out why I treat the child in these ways." So either on your own or with some outside help, you need to get a clear picture of what you are doing and why you are doing it. If an adult persists in feeling more concerned with avoiding his or her own anxiety, fear, and guilt than with the child's welfare, then no outsider can help. But much more common are adults who really do want to help their children but who need outside help to realize that what they had thought was for the child's good was actually unintentionally harmful.

Each of the problems we are discussing—learning disability and disturbingly hyperactive behavior—tends to carry with it particular sources of frustration for adults who deal closely with it. Some of the most common frustrations for each will be noted briefly, as a guideline for adults who are trying to identify their own reactions to such children. A parent of a learning disabled child may feel embarrassed to have a child who performs below the average level; he or she may or may not be aware of the embarrassment, for it is often masked by anger with the child for causing the embarrassment. There is also a cluster of feelings, one or more of which an adult may have, with respect to the questions, "Should we put pressure on this child to try harder?

How will the child respond, both emotionally and in terms of school achievement, to such pressure? How will the child's responses in turn affect the adult?" Depending, of course, upon the source, nature, and degree of the pressure and upon his or her history of learning failure, the child may respond to pressure with resentment, fear, or both. A teacher or parent may believe it is important to ensure that the child works at his or her optimal level, and that is hard to dispute. Still, if pressure, rather than patient, understanding attempts to motivate, has been used before or is attempted at the present, resentment or fear or both may characterize the child's response. This may cause the adult to feel further embarrassed, angry, or guilty (and thus, perhaps, to become overly indulgent). Now, because learning disability is a limitation in maturation of part of the brain needed to learn a given skill, it is clear that increasing a child's motivation will facilitate learning only up to the child's current level of cerebral development. Therefore, even a parent who felt no guilt about putting severe pressure on a child, or a parent who bent over backward to arouse the child's interest, could find that his or her efforts increased the child's learning only up to a point. Sometime around that point, learning cannot, for the time being, increase further, although the child's severe emotional disturbance certainly can. Then, an adult who wishes the child could do better but believes he or she cannot may feel helpless and frustrated. Being unable to accept the fact that the child cannot at this time do any better, the adult may feel angry.

A hyperactive youngster is a very unusual kind of child. Hyperactive people do not learn well from punishment. This means that until such a child begins appropriate medication or gets other effective help, his or her parents and teachers can easily experience frustration, which may lead to anger or withdrawal. Such a child, especially if young, is sometimes impulsive but not hostile or willful. He or she will not seem to be unresponsive to discipline out of rebelliousness or hostility, as one would see in some children. The child's behavior may be simply impulsive; but that impulsivity will lead the child to misbehavior or danger, and it will persist in the face of adults' efforts to eliminate it. The only change may be that, as time goes on, continued punishment will increase the child's resentment and hostility, though the problem behavior does not alter. In extreme cases, the child may be unresponsive to the point of avoiding looking one in the eye. Thus, an adult will feel helpless to change the child's behavior through discipline or punishment and will further feel guilty if the child seems unhostile and helpless to control his or her own actions. Suppose the parent or teacher then attempts to reason

with the child. Particularly if there have been other life stresses (such as parents' divorce or rejection by peers), the hyperactive child's typical defense of denying that problems exist will make even the most patient adult frustrated and impatient. One other common feeling of parents is embarrassment at having a child who deviates from the norm and who is beyond their control.

Once you have a picture of your current way of dealing with your problem child, you can begin to think about what to do, whether you want to make changes. If you want to change your own behavior, first consider what effects different kinds of adult behavior have on a child. In order to do that, one needs to be aware in some detail of how the world looks to children. Adults often realize that children do not think like adults; but in a stressful situation it is easy to overlook that fact.

The storyteller in *Portnoy's Complaint* (Roth 1970) relates that when he was a very young child he dashed home from school every afternoon, hoping to arrive in time to see his teacher rushing in through the window, changing into his mother. He was sure than they were the same person and could not understand by what magical means one became the other. This illustrates beautifully one aspect of how the world often looks to children. In some sense, one adult is like another adult. They are physically bigger than the child. They tend to be responsible for teaching the child what society wants, for setting up standards of achievement and behavior. Most adults in a child's life spend a lot of time telling the child what to do.

An experiment which illustrates something about children's view of the world was carried out by Marcel Kinsbourne and Rick Dorset (1973). They showed children pairs of parallel vertical lines, one extending slightly further than the other at one end. Sometimes this extension was at the top of the display, and sometimes it was at the bottom. They asked children whether the two lines were the same length or different lengths. They found that three-, four-, and five-year olds tend to look either at the tops of things or at the bottoms of things. If they were looking at the top, and the disparity in length of the line was at the top, they would say that one line is longer than the other. But if they were looking at the bottom, where there was no disparity, they would say the lines were the same length. What do we learn from this? We learn that children's attention is limited. Children don't tend to scan a whole room. They focus on part of something; the rest of the display can be irrelevant. They tend not to use careful, systematic ways of looking at the whole picture. This principle has applications in the child's learning of

social standards, of what other people want from him or her. The child does not have the maturity and experience to think, "This teacher or this parent wants me to achieve at a certain rate, but then that's not the only adult in the world." The child's inability to get the whole picture has various components. One is a thinking component. The child does not have the ways of thinking or control over his or her attention that an adult has. The second component is a question of socialization and power relationships. A child is relatively powerless; adults have a tremendous amount of control over his or her life. Therefore, it could be unrealistic from the child's point of view to look at the whole picture and say, "My mother feels this way, but there are lots of other mothers who wouldn't care if I tore up the living room." Thus, the child's view of the world is limited.

A similar pattern obtains in the area of moral development. Jean Piaget (1965) and Lawrence Kohlberg (1964) have delineated stages of moral development. If you tell people of various ages a story about someone's moral dilemma, and ask them what the character should do and why, their answers fall into a pattern, depending on what stage they have reached. Not everyone ultimately reaches the same level, but most children go through the early stages at roughly the same time. People's principles of right and wrong change as they get older. At the earliest stages, children may justify actions by saying something like, "Good boys don't do that, and I'm a good boy." This self-centered view does not involve consideration of anyone else but only of the principle that his parents had told him that good boys don't behave that way. Later, people gradually move to legalistic definitions: it is wrong because it is against the law. Still later stages involve considerations of harm to others, waste of human life, or other more abstract or altruistic principles.

Another aspect of children's moral development is demonstrated in Piaget's work. He gives children pairs of stories, such as the following, and asks "Which child did a worse thing?" Story A: Johnny was sneaking into the cookie jar when his mother wasn't around, and in doing so, he knocked over and broke two glasses. Story B: Tommy was helping his mother set the table. He tripped and dropped three glasses, which broke. Young children will say that the second child did a worse thing, because he broke three glasses instead of two. They consider the concrete result rather than the intention of the child. Now, this becomes extremely important in thinking about the situation of a child who has a learning problem, is hyperactive, or has a physical disability. Why? Because most children, including the child with the problem, look at results and behavior, not at the amount of effort a child makes or

what it costs the child emotionally. Thus, they will say, "That kid is dumb" rather than "He's trying his best, but he just can't do any better."

Some further research illustrates another aspect of the way children view the world. We examined sex differences in children's responses to failure. Dr. Kinsbourne and I (Caplan and Kinsbourne 1974) studied about 250 children, some of whom had had no learning failure experience and some of whom had had such experience. We asked them a number of questions about what they felt was important or allowable in school. It turns out that, when a child has failed to learn in school, the child's response to that failure will vary tremendously, depending on whether the child is a boy or a girl. Boys tend to be aggressive, to act out, to behave in an anti-social way. So, for instance, they show much more anger, much more criticism of other children's behavior. Girls become more "prosocially" aggressive, saying for instance, "Boys must not be noisy in the classroom. It is very naughty." Thus, prosocial aggression allows one to appear to side with the teacher, to maintain and advocate the adult standard of behavior, while actually criticizing someone who is behaving differently from oneself. This is how failing girls' anger and frustration tend to be expressed.

We also asked these children pairs of questions, such as, "Which is more important, to be nice or to be smart?" or "to be smart or to be good at sports?" or "to be nice or to be good at sports?" etc. Then we asked, "Who usually behaves in each of these ways, a boy or a girl?" We found that children have a clear order for ranking what they perceive to be important in school. The highest of these ranks is "to be smart." If you cannot be smart, then a close second is "to be nice." Much farther down on the list are "to be good at sports" and "to be a leader." Now, what does this mean for boys and girls who have experienced learning failure? It means that if you cannot be smart, you are much better off being a girl than a boy, because you are more likely to have been taught that it is important to be nice and well behaved. You will also have learned that it is consonant with "how a girl is supposed to be." One often hears little girls say, for example, "My daddy says it doesn't matter that I didn't do well in the tests, because I'm sweet."

For boys, the possibility of being nice, quiet, and well-behaved is much more fraught with conflict, because it is not "all boy," not stereotypically masculine, to be nice, quiet, and well-behaved. Boys often learn from their parents or other adults that they should be aggressive and disruptive; but when they behave this way in school, the teacher writes their names on the board, they have to stay after school, they are reported to the principal, and

their parents get angry. Meanwhile, these same adults often are smiling indulgently and are proudly saying, "You are all boy!" So the alternative of being the class cut-up or behaving aggressively is likely to produce strongly ambivalent feelings in failing boys. If a boy is smart, his school achievement is socially-approved, teacher-approved, and relatively masculine at that age. But if he is not learning in school, then his only alternatives are to be aggressive and tough, or to be one of the things that appear much farther down on the hierarchy of what young children consider important, i.e., to be good at sports or to be a leader. One other relevant point about being good at sports or being a leader is that it is harder to do those things than to be nice. If there are fifteen girls in a class, they can all be nice at the same time, and they can be nice in the classroom, nice on the playground, and nice after school. But if there are fifteen boys in the class, there cannot be fifteen leaders, and they are not all likely to be good at sports. Nor are these behaviors very visible in the classroom itself. So, the unconflicted alternatives for boys who have failed to learn in school are much more restricted that those for girls.

This has serious implications for boys and for girls in different ways. As we have said, if a boy does the all-male thing. he gets both praise and blame for it; but the positive side of that is that if a boy is failing to learn in school and behaves aggressively he is very likely to be noticed. Once a child is noticed, then a teacher who has to cope with 29 other children is likely to say, "I wish someone could do something about this child's behavior." Then either the teacher will discover that the child also has a learning problem or will plead, "Someone do something with this child," and in the process of "doing something" it will be discovered that this boy has a learning difficulty. So, by making boys more visible in general their anti-social behavior also makes it more likely that they will be helped. The girls who are failing to learn behave in a nice, quiet way. They do not bother anyone, and their learning problems are more likely to be overlooked than those of the boys. That is one reason that learning-clinic populations include far more boys than girls. There are several other reasons for this sex ratio, and some of them are very good ones, but the ratio seems to be aggravated by the sex difference in how children respond to failure. So if a child has failed, how the world looks will depend on whether it is a boy or a girl; the child's sex will put constraints on the behavioral or achievement alternatives the child feels are open to him or to her.

For many reasons, children have a very limited view of the world, and the effects of these limitations can be quite striking.

There was a case of a child who was basically fearless, but when he had to go to the hospital because of a stomach ache he was terrified. The reason was that on television he had seen people being x-rayed and he thought, "They've got this big machine, and they put it right on your stomach! It would crush you!" Adults know that sometimes large, heavy objects can touch you and rest on you without crushing you, but, in the child's experience, you usually do not want something huge on top of you, because you cannot get it off. The child has had little experience of a countervailing force supporting the object. It is easy to assume that the child knows what is going on, but the child can often be interpreting a situation in a very specific, upsetting way because of his or her limited abilities to scan and see the whole situation.

Another illustration of children's limited ability to get the whole picture is their use of humor. A five-year-old boy tells the following riddle: "What kind of dog has no tail? A hot dog!" He laughs, I laugh. He says, "That's funny isn't it?" I ask, "Is it funny?" "Yes," he replies, "I know it's funny because my big sister laughed when she told it to me." I ask him to explain what is funny about the riddle, and he ultimately confesses that he does not know, because "It is true that hotdogs don't have tails!" One substantial component of humor is a change of mental set. What makes a riddle humorous is that the question is constructed so that the listener adopts a mental set (i.e., the category of canines) which does not include the correct answer to the riddle. To solve the riddle, one must first suppose that a different mental set is required, then choose a different set, and, finally, actively switch to the new set. To appreciate the humor, one must be accustomed to rapid change of set, and one must be able to realize that two different sets are involved in the same, brief joke. Young children have not learned rapidly to switch their points of view. If this is true for a non-threatening situation such as hearing a riddle, one can imagine the distress of a child who hears, "You should be ashamed for being unable to read," and has trouble changing from that set to one that evaluates his personal worth on some other basis.

Given that children are like this, what can we do about it? For one thing, we can be careful in our assumptions about what children can understand. As a psychotherapist, I have often had the experience of hearing a patient become angry with me for asking "Can you tell me what you mean by that?" or "Would you say some more about it?" They often say things like, "I told you I was angry. Don't you understand what 'angry' means?" And the true

answer is, "No, not precisely enough to help you." It is risky, even with adults, to assume that you know what they mean, even when they use ordinary words. Often you will find that the other person has very different interpretations of these words from your own. This is even more true with children, whose experiences and ways of viewing the world are very different from yours. So, we can begin by acknowledging these tremendous differences.

Having come to understand the various ways that a child's view of the world is limited, what can we do to help the child? First of all, we can take great pains to understand what the child's communications mean. It is important not to assume that when a child says, "Well, I failed another test, but it doesn't matter," that the child does not care. On the other hand, one cannot assume that if the child acts upset about not being able to read, he or she really does care; it may only be that the child knows that the teacher or the parents care, and may be hoping to win approval or to avoid punishment by saying "I can't read, and you don't like it, and I don't like it either. I'm just as upset as you are." So it is crucial to try, in tremendous detail, to find out the child's feelings.

There are some dangers in this. You can appear intrusive to the child. This is particularly true if you have not honestly analyzed your own motives for wanting to know what the child is feeling. Is this the first step in an effort to get the child to do what *you* want? Your own purposes or goals may be less related to the child's abilities or comfort than you have thought. Or is your primary purpose a genuine desire to relieve the child's anxiety or fear? The major ingredient in not seeming intrusive to the child is usually genuine respect for the child. Haim Ginott (1965) has made excellent suggestions about how to talk to the children about their feelings, but I would add one cautionary note. Not only is the content important but also the manner in which it is spoken. One's manner is unavoidably influenced by one's feelings, and that is why I repeatedly stress the importance of understanding your own feelings when dealing with children. If your primary concern is the child's happiness, you can made a statement or ask the child a question, and he or she will sense that you really care. But if you feel angry, guilty, or ambivalent, then you can speak the same words, but the child will sense that his or her happiness is less your concern than your wish to have him or her behave in a certain way or to punish him or her. Perhaps an adult could say to you, "You seem angry with me. I think you really don't want to know how I feel. You are really irritated by my feelings or difficulties." An adult is better able

than a child to confront the speaker about nonverbal communications and implicit assumptions or expectations. A child has neither the thought-out viewpoint nor the position of power to do that. If a child thinks that an adult is inquiring about feelings for some reason other than sincere concern, then he or she will very likely perceive the message underlying the words. The child will not believe, "This adult cares about how I feel," but rather, "This person isn't satisfied with me," or, "This person is trying to get inside my head in order to change me." The child will then be more likely to react with fear or anger than to relax and feel free to talk about how he or she feels. No one is better than a child at picking up unspoken feelings and messages.

If, after you become aware of having mixed feelings about the child, you find that you are unable, even with professional help, to be rid of them, then it is usually good to tell the child that you have those feelings. If you do that in a calm and straightforward way, to the point of confessing that you are sorry about being so upset about his reading and are trying not to be so bothered by it, and that there is help coming for both of you, then the child at least can deal with a known quantity. He wants you to *care*, but in proportion. Unspoken anger or expectations are far more dangerous than those honestly acknowledged, for two reasons. One is that a child is likely to misinterpret or exaggerate unspoken messages, whereas a clear statement minimizes that possibility. The other is that an adult's calm confession of imperfection makes him seem more human, more approachable to the child. Remember, above all, that the basis of all action that can help your child is to have profound respect for that small person.

A second thing that you can do is to become the child's advocate with respect to the professionals around him or her. I have asked teachers, social workers, speech pathologists, physicians, and other psychologists, who have tested or worked with a child, what they believe is causing the difficulty. Often I have been unable to understand what they have said to me. Every professional specialty has its own jargon which is usually incomprehensible to anyone outside that field. This jargon often sounds so expert and authoritative that parents or other professionals are afraid to ask for explanations. If we are ruled by such hesitation, we do ourselves and our children a grave disservice. We remain in the dark about what is happening, and we are in no position to evaluate the treatment. Now, it is not up to you to *do* the testing or treatment, if you are the parent, or even if you are the professional who does not have the primary responsibility for testing and treatment. But you should be in a position to think logically about what somebody is doing to

the child. If your child has a broken leg and the doctor uses unfamiliar words to describe it then you do not know just what is broken. As a parent, a teacher, or anyone involved with a child, you must take it upon yourself to be unafraid of jargon, unafraid of professionals, and to say, "I don't understand what you're saying. Can you explain what this word means?"

Then you can think about the implications of what they have said. Suppose that someone tells you "Your son cannot read, and so we're going to have him practice walking in a straight line. In that way, he will learn how to read." It is not for you to say, "I'm just a parent, so I don't understand how that works." It is for you to think logically and say, "I'm sorry, doctor (or teacher, etc.), but I don't understand how walking a straight line will help him learn to read." It is your right and your responsibility to make certain that the professionals dealing with your child clarify for you every bit of their logic. If someone says "Walking a straight line will change something in his brain, and if you change one thing in the brain, then probably something else in the brain will change, and so the reading part of the brain will improve," then you can decide for yourself whether or not that is a logical statement. You can ask you pediatrician or neurologist whether physical exercise causes development of brain cells related to reading. You can decide for yourself whether the professional's evaluation of your child justifies what he recommends for your child's treatment. This is important for your own peace of mind, and it is vital for your child's welfare.

Once you understand what is wrong with your child and what is going to be done about it, you can alleviate a tremendous amount of the child's anxiety by explaining it to him or her as straightforwardly as possible. Some children think that they can not read because they were naughty or because the devil is in them, or because they are lazy. Even to a six-year-old, you can explain, "You have a brain which has many parts. Each part helps you do something, and some parts are bigger than others, just like some people have bigger hands than others. One part of the brain that helps you read just isn't growing as fast right now as the other parts, but there are things so and so can do with you that will help." Once you can explain something like that simply to your child, then you can make it less likely that the child will imagine guilt-producing or frightening reasons for the disability. The child needs to know the truth, and needs to know it in language that a child can understand, so he can look forward courageously.

With hyperactive children, the principles are the same. It is somewhat more difficult when the problem is hyperactivity, because the condition is

more difficult to explain and is more extensive in scope. With a hyperactive child you are dealing with the child's inability to pay attention and with other people's dislike of the way she or he behaves. So, questions of morality and of standards of behavior arise more quickly and intensely than with a child who has only a learning problem. Even so, there are ways of explaining to a hyperactive child why he or she has trouble settling down and paying attention, and may have to take pills at first when the siblings or classmates do not, and why the pills do not suddenly make him or her better in every way. It is crucial to explain that the pills do not absolve the child of responsibility for his or her behavior, that they do not work like magic so that suddenly good grades will result. All of these principles can be explained to the youngest of children. In our clinic, we usually say something like the following: "There is part of your brain which can make it either easy or hard for you to pay attention. There are two things you need in order to pay attention. One is that that part of your brain has to be working very well, and the other is that you have to try very hard." This makes it clear that the child has the responsibility for his or her behavior but also knows that it is not all his or her fault for behaving wildly. We say, "When you know you are learning and if you take your pills as long as the doctor says to, that will make it easier to pay attention when you try very hard."

A third thing you can do is to consider the possibility that you are overly permissive out of pity or guilt for a child who cannot read or who is hyperactive. Do you allow this child to do things you would not allow in other children? If so, how will that affect the child's behavior? You may allow the child to make excessive demands, and you try to justify that because you know he or she is frustrated in school, but that child does not have to live with you alone. He or she will come into contact with increasing numbers of children and adults, so you will want to consider whether the way you treat your child is encouraging behavior that will make other adults and children dislike him or her. Admittedly, it is painful to face a child who is frustrated in school and to have to say "Now here is something that you can't do because I won't allow it." You will probably feel you are just frustrating the child further. This is the time to think in terms of the long run. When you say "no" to your child, you are not punishing; rather, you are setting limits that will teach him or her how to get along with other people, how to achieve kinds of happiness other than from the reading he or she cannot yet do.

There is something else that all adults involved with hyperactive and learning problem children can do. It is based upon a very general principle,

which I shall call 'relativism," and it grows out of an understanding of children's view of the world, of what society, their parents, their teachers, and their peers expect of them. There were good historical reasons that general standards, universally applied, were originally established. Some of these standards are desirable simply because they are economical in terms of time. We learn very early that it is good to be smart and that it is good not to cause trouble for a teacher who is trying to control and teach 30 children. Most children *can* sit still in a classroom and learn something; they do not have trouble paying attention. Most children *are* able to learn to read when they are six years old.

But what happens when a child cannot meet these standards? Then, as the most important adult in that child's life, you have a tremendous responsibility. There is something you can do, and it requires very concrete action. It takes so much time, attention, and thought when you first begin, that it can seem overwhelming. As discussed earlier, regardless of your child's age, he or she does not have the cognitive or emotional capacity to put things into perspective, to weigh and pros and cons. So when a teacher has told the child, "You're not learning," you can create an environment that teaches the child that the failure of all children to learn the same way is not so all-important. You have to teach the child (and, if necessary, the teachers and the other children in the classroom and neighborhood) the concept of *individual differences*. You need not only to teach them this concept but also to believe in it deeply yourself. It is something people talk about all the time. They say "Aren't ethnic groups marvelous? Isn't variety a wonderful thing?" But when it comes to children, most people expect them all to have good grades. People profess devout belief in the principle of individual differences, but when it is their child who deviates from the norm, when they have to acknowledge that their own child is not typical, is not above average, is not even average, or being average, learns differently, it is harder to keep the principle in mind. But that is, of course, the very time that both the child and the involved adults need most to think about the importance and necessity of individual differences.

Let us consider, then, how to expand on what we can say to a child who has a specific learning disability. It is important to teach the child not only that he or she is not generally bad or stupid, but also that only one part of the brain is just now causing a problem. It is also important to explain that other people's brains are shaped mostly the same way as his or hers, and that those people have different parts of their brains, too, some of which work

better than others. It is particularly helpful to include your own brain in that category. Most children do not realize that their parents are imperfect until they reach adolescence; but you will want to make the supreme effort to teach your young child that you are not perfect. One of the best ways to make a child's learning disability or hyperactivity less upsetting to him or her is to say, "I have the same kind of problem, except mine isn't with reading; mine is with singing, or with finding my way around town."

Another aspect of relativism that is helpful if communicated to the child is the principle that, although reading is important in school and in the world, other things are important elsewhere. The child's abilities may make him or her more accomplished in a swimming pool than some of the best readers from the class. Basically, the important attitude to create in your home is "This child can do these things, but cannot do some other things so well or yet. Mother and father and brothers and sisters have things they do well and other things they cannot do." This attitude should also extend to the other children at the school. Most children by age 5 can stop and think what their best friend can and cannot do well. Once one begins to use this approach, it is surprisingly easy to maintain it. It is usually a tremendous relief for all concerned to drop the pretense that anyone is perfect, or should be perfect, or has to meet a certain standard in order to be acceptable. This makes it easier for the child to know what to say to other children, for example, "I'm in the lowest reading group because the reading part of my brain isn't growing very fast." When the child has the support of such simple but specific beliefs, then that child is no longer a "dumb" child; he or she, is, instead, a child who is basically normal but who has one area of brain that is growing slowly. In a relativistic atmosphere, if another child says "Ha, ha, you're in the lowest reading group," your child will know that the taunter has his or her own weak areas, too. Most importantly, your child will know that, whatever happens at school, he or she can go home and enter an atmosphere in which people are not judged only by how well they read. He or she will know that at home everyone is judged on a large number of different variables, possible achievements, and personality characteristics. Thus, home can become a refuge instead of another place with the same worries as at school. If a teacher will set up this kind of atmosphere in the classroom as well, so much the better. Then, children can learn because they are interested and can feel free to try as hard as they can, instead of feeling sheer panic when approaching a reading book as their only standard of measuring self-worth. Most of the work of establishing a relativistic atmosphere is done at the beginning,

because when children once learn the principle of relativism, it is so pleasant and interesting that it carries a lot of momentum with it.

There are a number of positive results of relativism. One is that, as mentioned, parents and the home become a refuge. As a virtually ironclad rule, it is important not to have the parents work with their own child on remedial reading, arithmetic, or whatever. That is not what parents are for; it is not why they decided to have children. Parents are there to love children, to have fun with them, and to help them enjoy their childhood and to grow up as persons. If the parents try to do any remedial teaching, their role as parents becomes confused for the child and they become one more source of pressure. Parents do well to provide a refuge. This is often extremely difficult for parents, particularly if they are excessively achievement-oriented. We saw a thirteen-year-old boy who was having various kinds of trouble in school. His parents were very intelligent and well-read in child psychology. We noted that their son was constantly obsessed with the question of whether he was achieving enough, and we suggested that the parents, especially the father, spend time with him in activities that were unrelated to school achievements. The extremely bright father replied, "All right, I'm willing to spend more time with him, but would you name three things that I could do with him?" So, we did. We made suggestions, such as taking walks together, and then the father said, "How about if he reads to me? He reads really well." We pointed out that he had just evaluated the child's reading achievement; though it was a positive evaluation, it was clear that the father cared deeply about how well the child read. And yet, for the son to read in front of his father could only further increase the boy's concern about the inadequacy of his achievements. The important thing was for the father to find things to do with his child that had nothing to do with achievement. If the child thinks of climbing a tree as an *achievement*, rather than as fun, then this parent must not watch the child climb trees.

Parent-child relationships can remain totally apart from the dimension of comparative achievement. If you think that kind of success experiences would help your child, then suggest that the teacher set them up for your child—but don't do it yourself. In the case of a child and parents who are acutely concerned about achievement, the safest thing is to make sure that they do not get into situations in which it matters to them whether the child can do well or badly.

This is one of several examples of Erik Erikson's (1963) concept of "basic trust." The knowledge that "somebody cares about me just because

I'm me" is one of the necessities for development of basic trust. A child needs to feel certain of getting some love, regardless of what he or she does or is able to do. Any child, but especially one who has had difficulties, needs to know that he or she has intrinsic worth and can get attention without asking for it, simply because you care. He also needs to feel certain that there are things that he or she can do to please you because he loves you, too.

No one of those things that the child can do voluntarily should become disproportionately important. This is another danger that a relativistic outlook can avert. To a child who has trouble in school, some other activity or behavior may become so important that it absorbs all of his or her attention and emotion. It may be sports; it may be (especially for a girl) being—always and above all—a nice person. Of course, that overemphasis should not happen. No one kind of behavior or achievement should become so crucial that the child feels that every positive reinforcement comes from that kind of behavior alone. Important as school achievement is, it must not eclipse the importance of a happy childhood and of the basically supportive parent-child relationship.

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The Dyslexic in the General Classroom

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After years of diagnosing dyslexic children, programming for them, working with their classroom teachers, and staffing with a great variety of resource people and parents, I have come to believe in a number of principles for teaching dyslexic, or learning disabled, children in the general classroom.

In presenting the principles, I will frequently preface my remarks with the word *We*. I believe that it often takes all of us—the classroom teacher, the psychologist, the educational consultant or diagnostician, the resource teacher, the principal, the school nurse, the guidance counselor, the music teacher, the art teacher, the remedial reading teacher, the physical education teacher, the custodian, the librarian, and the PARENT—working together in a consistent, supportive fashion to make school a profitable and, hopefully, a pleasant experience for the child with severe learning difficulties.

1. *The dyslexic child will not learn many of the important academic skills when taught incidentally and casually, but he will learn those skills if taught carefully and thoroughly and before he is whipped by failure.*

If you are teaching in a typical classroom, you realize that two or three children in your room appear to learn without any effort on your part. You also realize that most of the children in the room need to be taught but that they would be able to learn the necessary skills and concepts from almost any classroom teacher. Finally, you recognize that you have two or three children in your room who are not going to learn unless you teach them very carefully and very thoroughly.

This last group of children are those who need you the most; yet, they are the ones whom you are least prepared to teach. It is vitally important that we develop the ability to teach the dyslexic child.

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2. *A meaningful assessment of a child's strengths and weaknesses as well as his learning style must be carried out early in his life.*

A meaningful assessment should be carried out before a child enters kindergarten or shortly after, not to predict, not to label, but to plan academic success for the child who will need very careful teaching.

"By not recognizing and dealing with learning difficulties among school beginners, public schools unwittingly contribute to and increase the learning disabilities of many children" (Koppitz 1972, pp. 134–135). "Early recognition of the nature of a school learning problem may be the single most important factor in developing a successful therapeutic program" (Schain 1971–1972, p. 145).

3. *Ignore a child's label—zero in on what the child needs to learn.*

Three years ago, Jean Symmes wrote: "In my opinion, the use of a deficit explanation for any phenomenon that occurs in such a large percentage of the population is inherently questionable . . . the loose blanketing of from 10 to 30 percent of the population under one term would seem by now to be doing more harm than good conceptually" (Symmes 1972, p. 66).

Unfortunately, schools receive funding on the basis of children's deficit labels. This places emphasis on the child's deficits, whereas we need to place emphasis on the educational tasks that he is to learn, on the behaviors he needs to develop, and on the methods by which he can learn. We need to think of him as the child who needs to learn to discriminate between the short vowels, to sound-blend, to use the vowels correctly when reading or writing, to master the multiplication facts, or to learn the concepts presented in the sixth grade science text although he reads at the second grade level. As Barbara Bateman said, we need to be fully committed to the premise that "all children will learn if we teach well enough" (Bateman 1971, p. 15), or as Jerome Rosner (1975) said when speaking at a recent conference, "Children with learning disabilities CAN learn, but they surely have to be taught."

4. *Provide structure for the child who lacks the ability to structure his time, his materials, or his tasks.*

Many children who find it difficult to learn also find it difficult to know their left hand from their right, to know East from West or North from South, to know what day, week, or month it is, or to tell time by the clock. They appear to lack internal organization. They are literally lost in space, physical and temporal. As a result, they lack the ability to structure their time, their materials, or their tasks.

It becomes our responsibility then, in order to teach them, to build a structure, firmly yet gently, which will make it possible for each child to function effectively and comfortably and with dignity. Then, as a child gains internal control in the classroom and on the playground, in structuring his tasks or in handling his materials, we gradually begin to withdraw part of the external structure which we have erected—always ready to put it back again in the twinkling of an eye.

It also may be our responsibility, at times, to preserve the structure present in the school system. We need to think very carefully about the possible effect of some of the following practices on learning disabled, or dyslexic children, before we adopt them for all children: the open classroom, open spaces, building a round school house, departmentalization in the lower elementary grades, and team teaching. An elementary principal asked me recently, "What can we do for the children in our school who cannot handle our open classrooms and the open space concept which we adopted a year ago?" My first response was, "I wish that you had asked me that question before you arranged to adopt these practices."

Think about departmentalization from the standpoint of the hyperactive, distractible child. The bells may ring every 40 to 50 minutes. This is followed, each time, by five to ten minutes of noise and confusion in the halls and on the stairs. Each class period the child must adjust to a different teacher, a different room, a new arrangement or combination of students and, quite likely, he will be facing a different direction than he was facing during the previous period. For such a child, each of these may be a serious disruption.

Consider another innovative practice, team teaching. When contemplating team teaching, are we mindful of children with special problems? Might we not think about the child described by Marianne Frostig (1973) who needed three months each fall "to hear" his new teacher's voice? How long would it take for the same child to hear three teachers' voices? Six months? Nine months?

Before we put in innovations for *all* children, we need to think about the possible ill effects on *some* children. We need to keep in mind the structure that may be needed by learning-disabled children, and we need to remember the words of Marianne Frostig: "A well-planned school day and an orderly classroom are essential for them" (Frostig 1973, p. 16).

5. *Provide the best possible teaching for the learning-disabled or the dyslexic child at all times in all grades.*

A sixth grade student tutor or a teacher's aide may not always be what

the dyslexic child needs! The child may have so much confusion regarding his learning that he would profit more from the professional service and individualized attention of his very competent classroom teacher for two or three minutes each hour than he would from going out into the hall to work with a teacher's aide for half an hour or even an hour. I am afraid that I become visibly upset when, after discussing with the classroom teacher the very special needs of a disabled child, she says, "Well, I am getting a new aide next week. I'll let her work with him and see if she can do anything with him."

Dyslexic children do not profit from hit-and-miss, irresponsible teaching, or a "see-what-happens" attitude. These children need a Master Teacher all of the time in the actual teaching process in the classroom as well as in the directing of others who work with a child from time to time.

Even having a good teacher, however, does not automatically solve the problem. After diagnosing a very dis-heartened fifth-grade, non-reading girl, I was discussing with her classroom teacher some alternatives to reading in order that the pupil might learn certain concepts each day in language, social studies, science, and literature; but after listening patiently for a short time, the teacher pushed aside all suggestions by saying, "Well, I'll just let her sit in on each class and get what she can."

It is not enough for the kindergarten and elementary teacher to teach well. The dyslexic child must be taught thoroughly, carefully, and masterfully at every level: kindergarten, elementary, intermediate, junior high, and senior high.

6. *The best possible working conditions and materials must be provided for the disabled child.*

The child who is having difficulty with reading, math, and worksheets needs the best light, the best working conditions, and the best duplicated worksheets that we can provide. It is easy to economize thoughtlessly, as when our schools in the mid-west felt the energy crunch recently. In one school, every other light in each hall was turned off, and the 100-watt bulbs which remained were replaced by 60-watt bulbs. Because this school made use of numerous teacher aides, small tables and chairs lined all of the halls. For some reason, every table and chair in each hall happened to be under an unlighted bulb. Every time I walked through a hall, I saw at least eight children sitting beside a helper or an aide trying to read from a book or a worksheet. Some of the worksheets were so poorly duplicated that I was unable to read them without difficulty even in good light.

Some of the things which have been mentioned represent unintentional malpractice. I frequently, but kindly, remind the people with whom I work that it costs no more to duplicate a worksheet that can be read than it does to duplicate one that cannot be read. I have gained permission in a few schools to meet with the clerical help at the beginning of each school year in order to stress the importance of well-duplicated worksheets. It is essential that children be able to see what they are doing!

7. *Every child is ready to learn something every day.*

Englemann and Bereiter (1966) held as their basic premise that if the child has not learned, he has not successfully been taught. On the other hand, Dianne Shields (1973) believes: "The problem with learning-disabled children is not that they have not been taught, but that they have not learned from that method." Whichever view is right, a teacher cannot be content teaching a child nothing day after day. She will teach him the basic concepts which he needs to learn and is ready to learn that day—not necessarily the same concepts that the rest of the boys and girls in the classroom are ready to learn—and she will teach needed concepts in such a way that *he will learn them.* When the child leaves school each night, he will know, and the teacher will know, that *he has learned something.*

8. *We must recognize the effect of a variety of auditory and visual disabilities.*

It is essential that we learn to recognize clues of a poor auditory channel, a poor visual channel, or weaknesses in both the auditory and visual channel. As educators we have been painfully slow to recognize the effect of auditory-vocal and visual-motor disabilities and to deal with their complexity.

A child's inability to follow oral directions, to get meaning or enjoyment from a story that is read to him, to speak distinctly, and to discriminate between consonant or vowel sounds should lead us to modify our verbal instructions, to modify the child's learning tasks, and to modify our teaching methods.

A child's inability to get meaning from pictures, to identify or discriminate between visual symbols, to learn sight words, and to write legibly should lead us to modify our strategies and the child's learning tasks. Most importantly, we must teach children to read by a method that will bring success in spite of a unique or different learning style.

9. *We must be aware of the need to teach a child how to learn.* If a dyslexic child is to succeed in a regular classroom, the teacher must teach him how to learn. We must learn to recognize a child's lack of audio-sequential

memory and/or visual-sequential memory. We may need to modify the educational tasks which require audio-sequential or visual-sequential skills. We must help a child compensate for weakness in one or both of the sequential memory skills.

A good example occurred while I was conducting a workshop on learning disabilities several years ago. One of the teachers asked, "What's the matter with this one kid in my class? The other day, I sent him to the map to locate Constantinople. He looked all over and couldn't find it. Finally, I sent another pupil up to help him. After he saw it, I said, 'You go back to your seat and write Constantinople so you won't forget it.' " Then the teacher said to me, "Do you know how many trips he had to make to the map in order to write the word Constantinople?" I ventured, "Fourteen?" He said, "You are right, but how did you know?" I replied, "Constantinople contains fourteen letters and, in all probability, the boy lacks visual sequential memory. And most importantly, no one has taught him to modify the task or to compensate for his lack of visual memory."

How simple it would be to say something like this: "Look, I have noticed that you are remembering only one letter at a time and that you are trying to remember the letters as you *see* them. Now, there are fourteen letters in the word Constantinople, so that will mean fourteen trips, won't it? Would it help you to remember the letters better if you said the next two letters aloud, or whispered them to yourself, in order that your *ears* can help you remember?" The teacher and student might find that three or four letters could be remembered by that method, then later even five or six—or better, he could "chunk" the word into syllables.

10. *We must know, or find out, what to teach each child and how to teach him.*

John was in the first grade when I met him. His speech was characterized by a noticeable tongue protrusion lisp and a weak r. His grammar was characterized by such statements as "Her ain't dere." He lacked skill in rhyming and in sound-blending. He was weak in most auditory skills. His strengths consisted of an adequate visual channel, good handwriting skill, and good ability in numbers. You might be curious about his reading program.

In the classroom John was receiving instruction in the following: a phonetic reading program in which the short vowels were introduced before the consonants; an additional and independent phonics program unrelated to the reading program; a spelling program that was phonetically based but which was unrelated to either the reading or the additional phonics program;

and he was expected to watch the Electric Company program on television every noon while eating his lunch.

John went to a remedial reading teacher for one-half hour each day. She had been carefully taught by her university never to use the same reading material in the remedial reading program that is used in the child's classroom. So, she was instructing him in still another phonetically based reading program and, in this one, the consonants were introduced before the vowels.

Because John was having so much difficulty learning his sounds, he was also sent to the Title I teacher for one-half hour each day for individual instruction in phonics. She used a structured system in which all of the voiceless consonants were taught first, then the voiced or noisy consonants, next the singing consonants and, finally, the vowels.

How well could John read by April of his first grade year? He was unable to read one word! John's experience illustrates that teachers must know *what to teach* and *how to teach* it. We must know learning processes as well as educational methods and materials in order to match a child's unique learning process with the appropriate method and material.

Given such knowledge, a teacher would never subject a child to the mis-managed reading program which I have just described. The majority of children in the regular classroom will learn without a thorough understanding of their individual learning processes on our part, and without a meticulous matching of their learning styles with methods and materials. The child with severe learning disabilities will not. Common sense about each child must not get lost in the pedagogic shuffle!

11. *Diagnostic testing should lead directly into teaching—and we should teach for mastery.*

I believe that the best diagnostic testing is the informal testing that a teacher can do in the classroom whenever she is working momentarily on a one-to-one basis with a child. Surely, there is no better way to find out what concepts a child needs to learn or to find out why he is having trouble with a task. Lloyd Dunn wrote: "Master teachers are at the heart of an effective school program for children with mild to moderate learning difficulties—master teachers skilled at educational diagnosis and creative in designing and carrying out interventions to remediate the problems that exist" (Dunn 1968, p. 15).

I served as the educational diagnostician last year for Barbara who was in the third grade. The important things that I learned about her in the

diagnostic setting could have been learned just as easily by her teacher in the classroom setting.

I observed Barbara carefully as she completed an informal survey of math facts on a simple worksheet. Her response to 15 − 8 was 6. Her explanation of how she arrived at that answer was, "I counted the letters at the top of the page. Well, first, I counted the problems at the bottom of the page, but I got the wrong answer. So, I counted the letters at the top."

Simple, quiet, non-threatening questioning revealed that Barbara was in above her head in math waters. Her verbal responses were much more informative than a score on a standardized test or the number of correct responses on a worksheet would have been. Her verbal responses were important because they provided specific direction for a classroom teacher.

Mike, a ten-year-old boy in the fifth grade, was referred after he had withdrawn from the learning situation. It was said that he might have a learning disability. An informal assessment revealed that he had an excellent understanding of the math processes but that he was still counting on his fingers. His counting ability broke down when he needed to multiply such facts as 7 × 9 or to divide using such facts as 72 ÷ 8. He appeared deeply chagrined that he did not know the facts. Questioning revealed that neither did he have an idea of how many addition, subtraction, multiplication, and division facts there were, nor did he have a working knowledge of the structure of facts as they related to each process.

When shown a mimeographed copy of the addition facts in table form, Mike grabbed it from the examiner's hand. He scrutinized it carefully for two or three minutes, then he said, "Gee! This makes sense! Why didn't someone show me this before?" Mike was so desirous of help that he was put on a program to teach himself the math facts. Within three months he had mastered all of the addition, subtraction, and multiplication combinations. Seeing me in the hall one day he said, "Say, have you got one of those pages of division facts? I think I got something figured out. I think I already know them because I know my multiplication facts."

The answers and responses I received from simple informal testing and from quiet, non-threatening questioning lead directly into teaching and, ultimately, into learning for Mike.

Kevin was a fifth grader. Diagnosis and classroom observations revealed that he had a very poorly functioning auditory channel. When I asked Kevin what he was learning in math in the classroom, he answered, but part of his

answer was unintelligible. Questioning revealed that members of his class were learning something about geometry. A simple survey of mathematics facts disclosed that Kevin had mastered none of the facts beyond the 0's and 1's in addition and subtraction, and that he did not understand what arithmetic was about. And this child was expected to learn geometry.

I have tested numerous fifth and sixth grade boys and girls who were expected to use a dictionary but who had not yet mastered the alphabet. Last year, a fourth grade boy was referred for diagnosis. When shown the plus, or addition sign, he guessed that it was a vowel. Think of the confusion of such youngsters! We must teach what we teach to mastery!

A fifth grade teacher recently said, "I always give Jim the twenty spelling words each week, but of course I don't expect him to get them right." As if to prove her point she said, "He missed fourteen again last week." Teaching for mastery? No, quite the contrary. Such a procedure can more adequately be described as teaching for failure.

12. *The dyslexic child must be taught sequentially and in small steps.*

The remedial reading teacher of a second grade dyslexic child said recently, with hopelessness in her voice, "I have *introduced all* of the short vowel sounds to Elizabeth, but she cannot distinguish between any of them." Teaching sequentially and in small steps, a remedial reading teacher would make certain that Elizabeth could correctly identify and use one short vowel sound and, also, that she could easily discriminate between it and another vowel sound before introducing "all" of the other short vowel sounds.

Olive Bradfield (1961) once said: "Teaching a learning disabled child is like building a giant sky-scraper with miniature bricks." As teachers, we must determine what the child needs to learn, how small the learning tasks will have to be, and what method will be necessary to teach him. Then, we must get on with the erection of the skyscraper—one small brick at a time (perhaps a vowel), in proper order (or sequence), and with the appropriate mortar (or method).

We must learn how to teach each child to recognize the symbols, to visually discriminate between them, to identify them, to auditorily discriminate between their sounds, to write them, to say them, and to use them meaningfully in reading, writing, spelling, and math. We must learn to teach symbols so well that *every* child will have power over them.

We must use structured, well-sequenced, carefully paced reading and math programs, and we must leave no gaps for the learning disabled child. We must teach thoroughly and carefully each sound-symbol relationship and each

math symbol so that no child will forget it. It may take a week, a month or, in some cases, several months to teach a single sound-symbol relationship, but that is the kind of teaching that leads to mastery in reading and math. That is the kind of teaching that dyslexic children must have.

In teaching for mastery of sounds and symbols, we need to keep in mind that integration also has to occur. Many learning disabled children do not easily generalize or integrate what they have been taught; that is, they do not get it all together and, thus, are unable to use what they have learned. They may see and read the words *sat* and *fat* and be unable to generalize to the word *bat* or *that*. They may recognize a short *a* in phonics class and be unable to recognize it in spelling class or in reading class, or be unable to use it when writing a sentence. This is why the teaching of reading, phonics, writing, and spelling must not be taught as separate subjects or discrete skills. We want each child to "get it all together" and to be able to use what he has learned.

A packet of thin paper squares containing every symbol that a child needs to learn in order to get through the primary and elementary grades, a packet only one-third of an inch in depth, represents a gigantic road-block for numerous children! Unless we become more adept at teaching these symbols, many children will be eternally, functionally illiterate.

13. *We must be guided by the laws of learning.*

The majority of children in the regular classroom will learn something whether or not the teacher carefully abides by the laws of learning; the dyslexic child may not.

Let us briefly review some of the laws of learning. First, the child must learn basic concepts to the point of over-learning. Second, he must have frequent review. Third, he must be helped to order and size new material or, as Bruner (1960) said, he must be helped to structure his learning. In describing his travels around the United States with Charley, John Steinbeck referred to the same law when he said: "I wanted to go to the rooftree of Maine to start my trip before turning west. It seemed to give the journey a design, and everything in the world must have design or the human mind rejects it. But in addition it must have purpose or the human conscience shies away from it" (Steinbeck 1961, p. 58).

Furthermore, the child must be rewarded for correct responses. Also, we must avoid interference with his learning. In addition, we must be aware of the effect of negative transfer. How many times have you and I said to a child, "Oh, you got the right answer. Good for you." But the child had only accidentally gotten the right answer by using the wrong method. The next

day, we said to the child, "Well, what's the matter? You worked a problem like that yesterday and you got it right."

14. *We must teach dyslexic children how to learn.*

Mike was a fifth grade boy. Neither his text books nor his classroom teachers had helped him to put mathematics facts into a structure in order to make them "stick" or to be remembered. Each math fact, to him, was an isolated entity. He did not sense the relationship of one addition fact to another, the relationship of addition facts to subtraction facts, or the relationship of multiplication facts to division facts. He had no idea how many facts there were. How simple it would have been, throughout his school career, to let him know that math facts can be structured for easier learning. Whereas he had learned little "islands" of facts, such as $4 + 5 = 9$, $5 + 4 = 9$, $9 - 5 = 4$, and $9 - 4 = 5$, he needed to see how those little islands fit into the whole map. Remember Mike and the division tables (Section 11, above)?

If a dyslexic child is to succeed in the regular classroom, the classroom teacher must be prepared to teach him how to learn.

15. *Provide immediate reinforcement for correct responses and for adequate behavior.*

The child with learning difficulties often needs to be told when he has arrived at the correct response because he does not always know when he has achieved what the teacher expects. He has been wrong so often that he does not trust his own responses. The teacher needs to tell him when a response is correct—not tomorrow, not next week after the papers are corrected, but *now*.

The child with learning difficulties may also need to be told when his behavior is acceptable. Quite likely, he has been told often enough when it is not. He needs to know many times each day, if possible, that his behavior at a given moment is acceptable or, in fact, desirable.

16. *Provide alternatives to reading in the content subjects whenever necessary.*

When a non-reader is given an F in Social Studies because he can read neither his textbook nor his tests, he is not being taught; he is being failed! We must make it possible for a child to learn the concepts involved in each subject even though he or she is a non-reader. Then, we must make it possible for him to be tested fairly over those concepts. Providing some alternatives to reading should make it possible for all children to enjoy some degree of academic success.

17. *We must be accountable for each child's learning.*

Until such time as we become accountable for each child's learning, we will turn youngsters out into the mainstream of life who have been tragically mis-managed and grossly untaught.

In April, 1973, a school psychologist asked me to "look at" Lonnie and to provide a few suggestions to the reading teacher. Before seeing Lonnie, I examined his cumulative folder carefully. He was in the seventh grade. He was 13 years, 10 months, of age.

He was described as having a severe articulation problem and he was receiving help in the Speech Clinic at the local university. Lonnie was also described as having a mild hearing loss in the higher frequencies in both ears which was not considered to be educationally significant. An IQ score was entered and an indication that his intelligence had been tested at the educational clinic at the university. There was a letter from a psychiatrist describing Lonnie as a "dependent" child and recommending that he not be given any special help at school because it would make him more dependent.

Lonnie was also seen by an educational consultant during the fourth grade. The results of her testing indicated that, at that time, Lonnie was able to recognize 65 percent of the Pre-Primer words on the Botel Word Recognition Test. Although he was 10 years, 10 months, of age at the time, he achieved an age equivalent of only 6 years, 9 months, on the Developmental Test of Visual Perception. After administration of the Winter Haven Copy Forms, the educational consultant wrote: "Lonnie does not retain the memory of figures." The consultant made three recommendations: (1) Put Lonnie's material, such as spelling, on tapes. Use ear phones. (2) Limit his writing assignments. (3) Teach him to read through the use of Programmed Reading.

During the next three years, the WISC was administered to Lonnie six times. Each time, his IQ was within normal limits, but there was always a discrepancy between the verbal and performance sections of the WISC by as much as 23 points, with the performance IQ always higher. There was no indication in the cumulative folder that any of the educational consultant's recommendations had been carried out or even attempted.

Since I firmly believe that a child should not be tested outside of the classroom unless something is going to happen to him; *i.e.*, a teacher is going to teach and the child is going to learn, I tried to arrange a meeting with Lonnie's individual teachers before I met with him. I was told that the

teachers would not be able to meet with me, and Lonnie was immediately summoned over a high-powered loud speaker system to report to the principal's office at once. His introduction to me was, "Here he is."

I saw before me a young man who was well-built, handsome, and as tall as I. I introduced myself and invited him to sit across a table from me where he sat looking expectantly in a way that I shall never forget. I thought of the number of times that he had been tested in the past and the fact that nothing had happened as a result. I thought, "How can I do this to him? How dare I put him through another test session when I am not sure that anyone is going to teach him when I get through?" However, I managed to smile at Lonnie, he smiled at me in return, and the session began. Let me review quickly what I discovered about this young man who was in seventh grade and nearly fourteen years old.

Lonnie correctly identified 85 percent of the Pre Primer words on the Botel Word Recognition Test, an improvement of four words over the past three years.

While reading a first grade oral reading passage; he pointed to each word with his finger, he left off the ending of each word, and he had to have most words pronounced for him such as *like, does,* and *chair.* After reading the four-line passage, Lonnie was able to answer only one of the four comprehension questions.

On a listening comprehension test Lonnie listened with 100 percent comprehension at the fifth grade level and 63 percent comprehension at the sixth grade level. Part of a spelling test was given next. He spelled only two words correctly: *look* and *work.*

Part of a phonics test was administered, and Lonnie was able to identify and write the correct symbol for twelve initial consonant sounds. He was unable to identify any consonant blends or digraphs. He was not always able to identify a sound as a consonant or a vowel. When given the opportunity to identify five long and five short vowels, he made five correct responses by guessing.

When asked how he felt about math, Lonnie said, "I can't do fractions, long multiplication, division, or tell time." When presented with a few addition facts, he counted on his fingers to obtain the following answers, or he guessed: 6 + 3 = 8, 6 + 5 = 10. Lonnie also counted on his fingers, and guessed, to obtain answers to subtraction facts.

Believing that I had enough baseline data for his classroom teachers and a

tutor for three or four years, I put away my simple testing materials and Lonnie and I engaged in the following conversation:

Examiner: "What are you reading at school?"

Lonnie: "I am not reading in a book now. I sit in with the class."

Examiner: "How do you spend you day at school?"

Lonnie: "I study my spelling."

Examiner: "Do you get the words right?"

Lonnie: "No, I get them all wrong."

Examiner: "How do you study your words?"

Lonnie pulled a crumpled piece of paper from his shirt pocket on which were twenty hand-written, misspelled words. He said, "I copy them from the board, then I copy each one three times each day."

Examiner: "What are you doing in English?"

Lonnie: "*They're* doing plays. I can't remember and I can't say the lines."

Examiner: "What about Social Studies?"

Lonnie: "They are studying France. I just listen."

Examiner: "Do you like physical education?"

Lonnie: "We're playing Volley Ball now. I can catch and hit, but I can't run. I don't like to run."

Other conversation revealed that Lonnie had no special friends; he played checkers with members of his family; he watched TV a lot; he was unable to remember his phone number; and he was planning to get a job at a local factory when he is through school.

A conference with Lonnie's parents gave evidence of a great deal of care and concern on the part of his parents. His mother had transported him to the University Speech Clinic for speech therapy three times each week for two years, he had had psychiatric counseling for three years, he was wearing glasses, he was having orthodontic work done, and the parents were willing to hire a good tutor as soon as they were advised that Lonnie could have one.

Until such times as someone is expected to be accountable for each child's learning, we will turn out into the mainstream of life youngsters, like Lonnie, who have been tragically mis-managed and grossly untaught.

18. *We must spend as much time preventing learning difficulties as we spend correcting them.*

I am convinced that we can prevent much of what is called "learning disabilities" today. We can provide a meaningful pre-school or early kindergarten assessment of all children as a first step. What about the establishment of a well-structured developmental step between kindergarten and first grade, which I refer to as a transition room, for those children who have been to kindergarten but who are not ready for the first-grade world of symbols? Could we not provide meaningful interim steps throughout the student's school life, whenever needed, in the form of a transition room, a resource room, an itinerant teacher, or any one of a variety of educational and curricular alternatives?

As a means of prevention, should we not be hiring classroom teachers who have, as Barbara Bateman has suggested, specific, successful ways to teach all the essential skills of reading? Should we not examine the currently popular classroom arrangement of tables and chairs in kindergarten and primary grades in which one-fourth of the children must sit with their backs to the chalk-board or to the instructional center?

We must continually evaluate our practices in regard to some of our children: the vulnerable, the unpredictable, the immature, or those children who, for any reason, need careful teaching if we are to prevent an increasing number from wearing the label "learning disabled."

19. *We must be able to slip into their shoes.*

It is easy to overlook the fact that a dyslexic child can become exhausted doing an almost invisible amount of work. It is essential that, as teachers, we take a variety of opportunities to slip into his shoes.

After an exhausting day of teaching, take out the spelling workbook, the reading workbook, or the poorly duplicated math worksheet that your dyslexic child has labored over during the day. Look at it. Pretend that the symbols are hieroglyphics and that you are unable to decode all of them. Pretend that they keep changing in size and shape. Also pretend that they do not lie still on the page but, rather that they tend to swim around. Look at the blanks that you are to fill in. Think of the time pressure. Think of the admonition: "You must get this done before recess, or you will have to stay in and finish it." Look at the other workbooks that are still be be completed. Remember that you stayed in during both recesses yesterday, and during recess this morning. Remember that mother will drill you on word cards tonight. Dad will remind you again: "You'd better buckle down, or you'll be repeating this grade, too."

As you become enmeshed in the child's frustration, don't you find yourself looking around for someone who can help you, to tell you once again what the instructions are, and to let you know if the first answer is correct? Don't you want someone to stand by in case you run into trouble? Don't you wish someone would say, "If you can do the first five problems correctly and tell me how you got the answers, you will not have to do the rest of the problems on that page."

Let us dare to care enough that we will take frequent opportunitites to slip into the child's shoes.

20. *We must take some responsibility for keeping fuel in the child's tank.*

The dyslexic child does not burn different fuel than other children. He just burns more of it. He can use an amazing amount of fuel just turning in an incomplete, smudged, torn worksheet. He uses a lot of energy in doing what appears to be nothing.

First, we must make certain that the child's physical tank is not empty. I find a large number of learning-disabled children who come to school each morning having had no breakfast or having had, at best, a very inadequate breakfast.

Next, we must make certain that the child's emotional tank is not empty. And we must give him enough positive attention throughout the day that his emotional tank does not run dry. When, at the end of a day, a teacher says, "John, you have worked five of those problems correctly, and you were able to tell me how you got the right answers. You know how to do that type of problem," she is putting fuel in his tank for the rest of the day, with perhaps enough left over to bring him back to school the next morning.

In his book, *Games People Play*, Berne speaks of this phenomenon in somewhat different terms. He said, "If you are not stroked, your spinal cord will shrivel up" (Berne 1964, p. 14). The child with severe learning difficulties will need to be stroked and refueled often. Let us take the responsibility for keeping fuel in his tank. Let us stroke him as frequently as he needs it—and he will need it oftener than other children—in order that his spinal cord will not shrivel up. (The "stroking" and "shriveling" are metaphorical, of course.)

21. *We must demand that our training institutions do a better job of preparing us to teach the hard-to-reach.*

It has been said that "One who believes in the learning disabilities approach to teaching, quickly finds that it applies to all children everywhere.

Thus we have not really been talking about . . . the learning disabled . . . but about a scientific pedagogy for all children" (Bateman 1967, p. 302). Recently, Dr. Sylvia Richardson (1975) said, "We need regular teachers who know how to teach irregular children . . . If regular classroom teachers were trained to deal with these problems, labels would not be necessary for the vast majority of children who have learning problems." We need better preparation for teaching all children and we must insist that our training institutions do a better job of preparing us!

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REVIEWS

How to Use The WISC Scores in Reading Diagnosis, Evelyn F. Searls. 46 pages. IRA Service Bulletin. 1975.

This facile, compact explanation of the Wechsler Intelligence Scale for Children (WISC) is a good introduction for classroom teachers, tutors, and parents interested in the use of this standard tool in an assessment battery in the diagnosis of specific language disability. Although this pamphlet does not address the use of the WISC in diagnosing dyslexia, it provides a necessary discussion of the subtests' organization, scoring, and interpretation. The writing is clear and concise and makes a good addition to one's professional bookshelf.

More often than not, WISC scores are bantered around without a clear explanation of their role in reading diagnosis. Searls points to a growing trend—and is a good example herself—to examine the test, the subject's responses, and the inter-test variability in reading diagnoses. Her discussion adds much to the continued understanding of the proper use and potential misuse of this instrument in reading diagnosis in general.

—JpM

The Encyclopedia of Educational Evaluation, Ball et al. 515 pages. San Francisco: Jossey-Bass. 1975.

This compendium of short articles on educational measurement provides quick useful information on practically every topic from accountability through job analysis to technical measurement considerations. This reference text offers a wealth of information on so many subjects, that this reviewer encourages his readers to consult the work to see how concise and effective these discussions of educational evaluation are.

—JpM

12 to 16: Early Adolescence, Jerome Kagan and Robert Coles, editors. 356 pages. New York: Norton, 1972.

For those familiar with the work of Jerome Kagan and others in the field of adolescent psychology, this collection of articles focuses on the critical

topics in this area. Since early adolescence is often a confusing period to the child, to his peers, and to the adults in his world, it makes a natural subject for inquiry. This volume opens new areas of investigation with articles from thirteen leading social scientists. The articles are closely related; Kagan and Coles weave the themes of their contributors into a poignant description of the problems of early adolescence. Such topics as physical maturation, the social characteristics of early adolescence, the discovery of self, the growth of political awareness, and the young adolescent in the family and school point out the problems inherent in each and also point to the beginning of each topic's resolution. This book of essays is of value to parent and teacher, and should be on the bookshelves of both.

—JpM

Emotional Problems of Adolescents, 3rd edition. 1976. J. Roswell Gallagher, M.D. and Herbert I. Harris, M.D. New York: Oxford University Press.

This is an extensively revised version of a valuable work for everyone who has to deal with the problems of adolescents. There is a chapter on dyslexia, which makes the book especially relevant for readers of the *Bulletin*. A notable quotation from this highly recommended work sets the tone: "Remember always that kindliness antedates psychiatry by 100's of years." This book is full of kindliness and wisdom and understanding—including the understanding of the problem of dyslexia.

—MBR

Developmental Dyslexia: Neurological Aspects, by Arthur L. Benton. *In* W. J. Friedlander (ed.). *Advances in Neurology*, Volume 7. New York: Raven Press. 1975.

Benton has provided a well organized, thorough, and unbiased review of developmental dyslexia within 46 pages of this volume, including 189 references. The article is subdivided into segments consisting of features of developmental dyslexia in which he reviews nicely the problems of definition, ascertaining prevalence, performance characteristics, course and outcome, reported correlates, and hereditary aspects. He then goes on to amplify reported correlates of developmental dyslexia including visuoperceptive deficit, impairment in directional sense, defects in intersensory integration, gener-

alized language disability, deficiency in sequential perception, disturbance in finger recognition, cerebral dominance, electroencephalogram and evoked responses, and neurological abnormalities. In addition, he reviews neurological theories that have been proposed regarding developmental dyslexia. Finally, he provides a brief summary and conclusions. The article is well-written and provides the reader with an excellent survey of most, if not all, of the areas in the neurologic domain pertinent to developmental dyslexia. The extensive reference list enhances the value of the article as a resource for those involved in either the theoretical or practical aspects of diagnosing and treating dyslexia. For those concerned with remediation solely, the article will enhance the conceptual base from which therapists must work. This paper should be included in the library of every major medical institution, as well as in the libraries of schools and departments with training programs in language disorders, whether they are in speech pathology, special or general education. In an area fraught with controversy, this review is a refreshingly dispassionate, concise, yet meaty, piece of work.

—D. D. Duane, M.D.

An Introduction to the Study of Man, by J.Z. Young. New York and Oxford: Oxford University Press. 1971.

The Understanding of the Brain, by John C. Eccles. New York: McGraw-Hill Book Co. 1973.

The Mystery of the Mind, by Wilder Penfield. Princeton, N.J.: Princeton University Press. 1975.

As an oldster, I take great pleasure in reviewing this trio of books for colleagues of all ages whose view of our interface area of interest is fed by both individual flashes of discovery and creations of synthesized relationships.

The former are generally thought to be characteristic of the work of fresh, young geniuses like Blaise Pascal and the youthful Einstein. They provide breakthroughs from the limitations of the gradually solidified, stereotypic thinking of past-oriented culture forms. In so doing, they not only liberate our thinking but also supply prime building blocks for new structures and show new routes for finding understanding. They are the mutants which give cultural evolution its "quantum kicks." They start us moving in different and more fruitful directions.

But the great edifices of "*homo aculturensis*" are the major syntheses of wise elders. For these we can be grateful to these persons' intellectual and personal capacity for continued growth and creativity and to their longevity, accompanied by inner and, if they are fortunate, outer freedom to continue the building of monuments to the work of their lives.

An organism, perhaps, is a more appropriate metaphor than is a monument, suggesting as it does a creation not just grand and beautiful, awe-inspiring and spirit-nourishing, but one which can project itself into the future of mankind, potentially changing his culture. This sort of creation is, one might say, a breakthrough of a higher order, a route opener for the progress of the species. One informed and fundamentally disciplined human mind can bring together many streams or strands or multidimensional orders of thought and experience, and so make the best possible use of maturity.

As knowledge builds up at an ever-increasing pace, much can be gained by computerized compaction of its mutually relevant items and aspects, showing significant associations and trends. And yet, in the end, there is no substitute for the ultimate, even transcendent, transformation of this knowledge by that most creative use of selection and fusion which we call wisdom.

Such wisdom, however free and brilliant the Wise One, usually stems from two sources, energetic, directed labor and the ripening of time and thought. These culminate in a recombination of experiences with the addition of new, fresh insights from that one mind and spirit which is innovative as well as comprehensive.

In the three books here reviewed, and in some others commented on in this issue, we have all the foregoing elements and processes. This they have in common with the work of the best teachers of all times. Such teachers, coming to us in person or in print, are the towering giants who have affected the personal development of each of us; each of these men speaks to us out of a long career of teaching as well as personal involvement in scientific research of high order.

Professor Young, writing from London, pursues "the search for an adequate approach to man" as a developing biological entity with a long history and a rich social matrix. The author's 641 pages of text, illuminated by graphs and illustrations, is amplified by 78 pages of bibliography, indexes, and a generous glossary which helps the serious novice or cross-disciplinary reader keep up with the necessary technicalities of vocabulary.

The account ranges from man's chemical constitution, through his genetic, evolutionary and individual development (there is a good summary of

Piaget) to his social and cultural organization. His physiology, his neurological functioning, his use of language, and his consciousness are all treated, although references to some aspects of language and variations in the language function may be too historically inadequate and tangential to satisfy those with special interests in this field. Many of the questions the author raises about our emotional, aesthetic and spiritual interests are even now, as he urges, being explored anew through studies of the brain's right hemisphere and further explorations of the nature of consciousness.

A major difficulty in examining any large, complex, comprehensive entity, such as man, and especially one which is dynamically functioning and changing, is that it ought to be comprehended globally. The full understanding of each component needs to be based on the prior knowledge of all the others in relation to it and to each other—a clearly impossible task! Even to the extent that a lifetime of the author's effort has built up a global understanding, the communication of this wholeness in verbal language, no matter how skillfully employed, is determined by the linear, temporal nature of verbal expression. First, as the general semanticists point out, we can never tell all about anything. Secondly, we cannot say at one time all that can be said. It should not, therefore, surprise us that Young's discourse, compendious as it is, must (with his apologies) touch lightly on some important areas, nor that it has to follow such themes as inheritance, evolution, language, learning, social interaction, the uses of human variety, and many others, through parts of many logical mini-sequences.

Here, as elsewhere, we are challenged to make for ourselves the connections between this excellent background book and more than the author gives of the special problems of understanding and coping with variations in language patterns, and, also, the newer presentations on brain physiology and function. For example, he rather begs the mind-brain question to which Eccles and Penfield address themselves more fully, saying that the biologist may "hope that with further knowledge . . . the problem of the mind will simply disappear" (p. 139).

Whereas Young's book is designed as a wide-ranging introduction to the larger field, Eccles, recognized expert in brain science that he is, speaks (now in the USA) from an equally comprehensive knowledge of a more specialized subject—the brain as it tries to understand itself. He has written one of those direct, succinct, completely satisfying series of lectures covering a specific subject which wise professors choose as a text for bright, serious students, and also recommend to their friends as general readers. So discriminatingly

does the author select from the thousands of pages of published data (including his own) and from his 45 years of teaching experience that he gives the reader a sense of maximum coverage and enlightenment without waste of time and wordage. He says, and suits the action to the word:

> I believe that we senior scientists have an obligation to communicate our scientific ideas to as wide an audience as possible. It is easy to talk in a technical language to the initiated; many do not try the exacting and vulnerable task of simplification, yet with preservation of the scientific character.

He succeeds, in 223 pages of text, two carefully selected bibliographies and an excellent glossary. This reviewer finds him vulnerable, even culpable, only in the omission of an index. Perhaps this will be remedied in a later edition.

His six lectures are titled: Neurones, Nerve Fibers, and the Nerve Impulse; Peripheral Synaptic Transmission; Synaptic Transmission and Pathways in the Brain; The Control of Movement by the Brain; The Building of the Brain (Neurogenesis): Slow Plastic Changes and Learning; Brain, Speech, and Consciousness.

He leads through the fundamentals to consideration of the differential functioning of the human brain hemispheres, the connection between objective reality and consciousness, the liason between mind (the self) and brain, and the function of culture in the evolution of human culture and potential. That he does not gain brevity at the expense of vivid specificity is particularly well shown in his description, in Chapter 5, of the biological process by which each human brain is built. This brain he characterizes as, "the most complexly organized structure in existence, beyond compare with even the most complex man-made objects, the computers . . . constructed in all its details before it is used." His discussion of the establishment of engrams as the mechanism of learning and memory strike a resonant chord with students of the work of Samuel T. Orton.

Eccles' final chapter, Brain, Speech, and Consciousness, is likely to prove most interesting to readers of this review. It is here that he makes the connections between brain science and the development of language, describes the complexity of the language processes, differentiates the functions of the two hemispheres, and raises, and in a measure answers, the philosophic questions of the apprehension of reality, consciousness, and the relation of mind, brain and self. As the questions are becoming clearer, so, he gives us to

believe, are the hopes for answers which may satisfy the philosophic quest—only, no doubt, to raise even more difficult and searching questions.

Eccles takes us with him to the growing edge of a true frontier of knowledge. So does Penfield in his last book, the summation of the findings resulting from a long and productive life's work. This is the most recently published of these three books, and, physically, I have found it the most elusive! I got it at once, on publication, and found in its reading all the excitement and satisfaction one expects from a final chapter in a great series. Then, almost immediately, it vanished into the hands of an unknown borrower. Not trusting the unreinforced memory engrams, I have pursued a duplicate copy in several book stores, to be told by the knowledgeable ones, "Yes, we had it, but have sold our last one." From public and university libraries, both in the USA and in Penfield's Canada, I have heard, "It has just gone out," or "A faculty member has it for the summer." Everybody, it seems, who is interested in Penfield's concluding thoughts is either reading them or standing in line to do so. This is as it should be, for he has cogent things to say not only about the brain but about the mind for which it is the vehicle. Penfield comes to grips with the nature of mind, and even with the location of the seat of its "higher mental powers" within the brain. He speculates upon the nature of a kind of universal mind and Man's relation to it and comes closest of these writers to a statement in religious terms. Alas, I cannot quote his words; you must find the book and read for yourself.

Here, then, are works of Three Wise Men, scientists and teachers all, from Britain, the USA, and Canada, each bringing us in his characteristic way the distillations of his findings, his feelings, and his conclusions. We are fortunate, indeed!

—MBR

The Ascent of Man, by Jacob Bronowski. Boston: Little, Brown & Co. 1973.

Another basic, and regrettably last, book by an author at home in all that touches on the history and science of man is this volume derived from the 13-part BBC series enjoyed by many TV viewers. Its factual and philosophic approach covers just about every aspect of life which has made man what he is and challenges him to take hold of his own future as a responsibly evolving species. Bronowski includes genetics, biology, physical and cultural anthro-

pology, mathematics and science, astronomy, history, archaeology, architecture, and the arts, all woven together by a philosopher into a complex but comprehensible whole.

Readers of the *Bulletin of the Orton Society* should be especially interested in the final chapter, "The Long Childhood." Since human beings have *will*, defined by the author as, "the capacity for choice in action," we need time for each individual to assemble the raw materials and experience for thought and decision, to learn language, and to use it with thought and skill.

This is a truly basic book for anyone who would help students and teachers to know themselves as human beings. It is exceptionally readable without being journalistically "popular" in style. The illustrations are copious, admirably designed and printed, and they skillfully clarify the text. It is a beautiful and valuable book.

–MBR

ORTON SOCIETY-SPONSORED BOOK PUBLISHED

Reading, Perception, and Language: Papers from the World Congress on Dyslexia, edited by Drake D. Duane and Margaret B. Rawson has now been published in both paper-bound and cloth-bound editions.

In a review in *Choice*, a leading periodical for professional librarians, this book is cited as a "very good collection of papers" that "could be read profitably by almost any student of language." It is being used at several universities in graduate courses in language disability, psychology, child psychiatry, and related fields.

The paper-bound edition, published by The Orton Society, is available to members for $5.56 if ordered (prepaid) through the Society's office. (The list price at bookstores or from the distributor, The Williams and Wilkins Co., is $7.95.)

The cloth edition, published by York Press in Baltimore, is available to members of the Orton Society for $10.00 (prepaid) if ordered through the Society's office. (The list price at bookstores or from the publisher is $12.50.)